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NINTH ANNUAL REPORT

PROCEEDINGS
Oregon State Horticultural Society

THIRTY-SECOND ANNUAL MEETING

SALEM, OREGON
December 6, 7, 8, 1917

NINTH ANNUAL REPORT

PROCEEDINGS

OF THE

THIRTY-SECOND ANNUAL MEETING

OF THE

OREGON STATE HORTICULTURAL SOCIETY

HELD DECEMBER 6, 7, 8, 1917
SALEM, OREGON

ORGANIZED 1885
INCORPORATED 1901

Salem, Oregon:
The Pacific Homestead
1918

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A photo taken twenty years ago showing a number of prominent Horti culturists at that time, four of whom are now deceased.

OREGON STATE HORTICULTURAL SOCIETY

Officers

Dr. C. H. Bailey, President, Roseburg
Ben Worsley, Vice-President, Astoria
C. D. Minton, Secretary Treasurer, Portland

Board of Trustees

Charles L. McNary, One Year, Salem
A. P. Bateham, Two Years, Portland
Henry E. Dosch, Three Years, Hillsdale

Auditing Committee

Albert Brownell
C. A. Burt
J. B. Pilkington

Committee on Needed Legislation

Robert C. Paulus, Salem
H. B. Miller, Portland
Dr. C. A. Macrum, Mosier
Ben Worsley, Astoria
L. T. Reynolds, Salem

Honorary Members

Atwell, H. C. (1911), Forest Grove
Cardwell, Dr. J. R.* (1897), Oregonian Bldg., Portland
Dosch, Henry E. (1911), Hillsdale, Portland
Lake, E. R. (1892), Pomological Dept., Washington, D. C.
Lambert, J. H.* (1895), Portland
Luelling, Seth* (1895), Milwaukie
Miller, H B. (1911), 509 E. 21st St. N., Portland
Smith, E. L. (1911), Hood River
Starr, James E.* (1893), Portland

*Deceased.

Life Members

Anderson, Nils P., McMinnville
Armstrong, E. C., Salem
Bateham, A. P., Portland
Better Fruit Pub. Co., E. H. Shepard, Hood River
Bridge Horticultural Society, Bridge, Coos County
Brownell, Albert, Sargent Bldg., Portland
Brumfield, J. T., Portland
Bryant, Hub., Albany
Carter, J. L., Hood River
Central Horticultural Society, Coquille
Chase, W. E., West Ave. and E. Burnside, Mt. Tabor, Portland
Clark, L. E., Hood River
Coos Bay Fruit Growers' Association, Marshfield
Cordley, A. B., Dean, O. A. C., Corvallis
Daugherty, Otis Ray, R. F. D. 1, Molalla
Davidson, Frank L., Hood River
Davidson, P. S., Hood River
Eggert, Mrs. Fred'k, 265 14th St., Portland
Esterly, H. M., Yeon Bldg., Portland
Fanning, A. M., Sheridan
Fargo, G. K., 83 Fifth St, Portland
Forbis, John F., Dilley
Goodrich, A. C.* Yamhill
Groner, Ferdinand, R.F.D. 2, Hillsboro
Gale, H. E., Merlin
Holaday, Asa, Scappoose
Holt, J. O., Mgr. Eugene Fruit Growers' Association, Eugene
Howe, Ed. L., Multnomah Hotel, Portland
Laidlaw, W. A., 1515 Belmont St., Portland
McCargar, C. A., Yeon Bldg., Portland
McDonald, M., Oregon Nursery Co., Orenco
McGill, A., Beck Bldg., Portland
McNary, U. S. Senator C. L., Salem
Marcum, C. A., care Portland Hotel, Portland
Mason, Julius L., Hood River
Meier, Julius L., care Meier & Frank, Portland
Minton, C. D., Portland

AMENDED ARTICLES OF INCORPORATION

of the

OREGON HORTICULTURAL SOCIETY

Know All Men by These Presents: That we, the undersigned, Homer C. Atwell, of the county of Washington; Frank W. Power, of the county of Multnomah, and James R. Shepard, of the county of Polk, all in the state of Oregon, being officers of the Oregon State Horticultural Society, unincorporated, and having been duly elected to the respective offices hereinafter specified, in accordance with the usages and regulations of said Society, do hereby associate ourselves together for the purpose of incorporation, under and by virtue of the general corporation laws of the state of Oregon, relative to religious, literary, benevolent, charitable and similar societies; and we do make, subscribe and adopt, in triplicate, these articles of incorporation, to-wit:

1. The name assumed by this corporation, and by which name it shall be known, is Oregon State Horticultural Society; and its duration shall be unlimited.

2. The object, business and pursuit of this corporation is, and shall be, as follows: (1) The development of agricultural and especially of those branches known as horticulture, floriculture, arboriculture, and forestry; (2) the development of landscape gardening, and of all arts, sciences and instrumentalities likely to elevate the character of the rural population and increase the profits, comforts and pleasures of rural life; (3) the collection, preservation and dissemination of knowledge relative to the foregoing and other kindred subjects; (4) the exploitation and development of all agencies tending to conserve the natural resources of the country, and to arouse the public to an interest in such conservations; (5) to acquire, own, hold, use, sell, and otherwise dispose of and convey real and personal property; to accept, receive and use gifts, devices, legacies, bequests, and legislative appropriations; to borrow money, and execute therefor its promissory notes, mortgages and other assurances; (6) to do any and all other acts and things which may be necessary, advisable or convenient, for the purpose of more effectually accomplishing the purposes aforesaid, or any of them.

3. The estimated value of the property and money possessed by said Society at this time is one hundred dollars; and the sources of its revenue or income is, and will be, dues of its members, subscriptions, donations, devises, legacies, bequests and legislative appropriations, and any income which may be derived from the investment or use of any moneys or property so acquired.

4. The respective titles of the officers making these articles are as follows: Homer C. Atwell, president; Frank W. Power, secretary-treasurer, and James R. Shepard, vice-president. They shall hold their respective offices until their successors therein shall be duly elected and qualified. Their successors in office shall be elected by a majority vote of the members of said Oregon State Horticultural Society who are in good standing and present, and voting, at an annual meeting of said society on the first Tuesday of December, 1909; and on such other day

and month of each succeeding year thereafter as may be designated in the by-laws of said society as the date of its annual meeting, said annual meetings to be held in the city of Portland, Oregon.

5. The location of said Society shall be in said city of Portland, in the county of Multnomah, and state of Oregon.

HOMER C. ATWELL, President,
J. R. SHEPARD, Vice-President,
FRANK W. POWER, Secretary-Treasurer.

We, the undersigned, A. P. Bateham, president; E. H. Shepard, vice-president, and Frank W. Power, secretary-treasurer of the Oregon State Horticultural Society certify that at the annual meeting of the Society held November 16, 1911, the following resolution was unanimously adopted:

Resolved, That the officers take the necessary steps to file amended Articles of Incorporation placing the legal powers of the Society in the officers and three trustees, in place of the officers alone, as at present.

In accordance with said resolution the following to be known as Section 6 in the Articles of Incorporation will be appended as the amendment thereto:

"Section 6. The management of the affairs of the Society shall be vested in the president, vice-president and secretary treasurer and three trustees. They shall be elected at the annual meeting each year, which shall be held at such time as may from time to time be fixed by the by-laws. The officers and trustees shall hold office for such time as provided from time to time in the by-laws."

Signed in triplicate and sealed with the seal of the Society this fifteenth day of October, 1912.

A. P. BATEHAM, President,
E. H. SHEPARD, Vice-President,
FRANK W. POWER, Secretary-Treasurer.

Acknowledged before Notary Public.

AMENDED BY-LAWS OF THE OREGON STATE HORTICULTURAL SOCIETY.

(Adopted November 20, 1912)

ARTICLE I—THE SOCIETY YEAR

The Society year shall begin on the first day of January.

ARTICLE II—MEMBERSHIP

Section 1. The membership of the Society shall consist of annual, life and honorary members.

Section 2. Any person who shall pay the annual membership fee of one dollar shall thereby become a member for the current year, ending with the opening of the next annual meeting.

Section 3. Any person who shall pay the life membersihp fee of ten dollars shall thereby become a life member and shall be excused from further payment of membership fees.

Section 4. Any person who in the opinion of the Society has done the society or horticulture in general some especially valuable service may be elected to honorary membership by a two-thirds vote of the members present at any regular meeting and shall be excused from payment of all membership fees.

Section 5. Those who were honorary members before the incorporation of this Society shall continue to be considered honorary members, without further action of the Society.

Section 6. All members shall be entitled to the same rights and privileges.

ARTICLE III—OFFICERS

Section 1. The officers of this Society shall be a president, a vice-president, and a secretary-treasurer and three trustees. The last four shall be under bond in such sum as the Society may designate for the faithful discharge of his duties.

Section 2. The president and secretary shall be ex-officio members of all committees, except the auditing committees.

Section 3. The duties of said officers shall be such as usually devolve upon like officers in similar organizations; provided, that no bills shall be paid without the approval in writing of the president and secretary; and provided further, that a committee of three, to be chosen annually by the Society, shall audit all bills, reports and accounts and render a report thereon to the Society.

Section 4. The secretary shall, at each annual meeting, render a report showing:

First—The personal property of the Society in his hands.

Second—The irreducible funds, securities and bills receivable belonging to the Society, stating how such funds are invested, and the interest then accrued on the same and on the other securities and bills receivable. Said report shall cover all documents of permanent value or use.

Third—He each year shall render to the auditing committee a complete report of the cash receipts and disbursements for the preceding year and this report, together with the report of the auditing committee, shall be made a part of the proceedings and printed in the annual report.

Fourth—The premiums offered, and by whom offered, and what was the final disposition of same.

Section 5. The three trustees appointed by the governor as a Board of control of the state, appropriation, together with the president and secretary of the Society, shall constitute an executive committee, which committee shall be empowered to transact any and all business of the Society that may be necessary between meetings of this Society.

The executive committee shall from time to time fix the compensation of the secretary of this Society as they may deem the requirements of the office may justify.

ARTICLE IV—DATE OF ANNUAL MEETING

The annual meeting shall be held on such days in November or December of each year as the officers may, from year to year, designate. The officers shall be elected on the afternoon of the second day of the annual meeting. The president, vice-president and secretary-treasurer shall take charge of their office on the first day of January next following their election and hold office for one year, or until their successors are elected and qualified.

The trustees shall be chosen in accordance with the Act of Legislature so long as an appropriation is given by the state, and unless otherwise provided therein shall hold office for three years. In case the legislature shall fail to grant an appropriation in any year, the trustees shall be elected for three years by the Society.

ARTICLE V—OTHER MEETINGS

Section 1. Other meetings may be held at such times and places as the Society by vote at a previous meeting may designate.

Section 2. The president may call a special meeting at Portland by causing notice thereof to be mailed to each member at least five days previous thereto, such notice to state the object of such meeting.

Section 3. It shall be the duty of the president to call a special meeting whenever requested in writing so to do by fifteen or more members.

ARTICLE VI—PUBLICATIONS

Every member shall be entitled, without cost, to one copy of all official reports published by the Society.

ARTICLE VII—QUORUM

Nine members shall constitute a quorum for the transaction of business, but a less number may meet, call to order, and adjourn from time to time.

ARTICLE VIII—ORDER OF BUSINESS

The following order shall be observed as a guide in the transaction of business at the annual meeting of the Society:

1. Call to order and reading of minutes of previous meeting.
2. Reports of officers.
3. Reports of committees.
4. Unfinished business.
5. New business.
6. Election of officers.
7. Papers, addresses, etc.

ARTICLE IX—RULES OF PRACTICE

Roberts' Rules of Order shall govern the deliberations of the Society.

ARTICLE X—IRREDUCIBLE FUND

All life membership fees, together with the sum of $2,000.00 of the amount heretofore realized from the bequest of the late Cyrus E. Hoskins, the "Lambert Fund," and the "Cardwell Fund," shall be kept intact and invested on good security, so as to produce a revenue, if possible, and only said revenue shall be expended by the Society.

ARTICLE XI—PERSONAL PROPERTY

The secretary shall be the custodian of all badges, banners, dies, medals, blanks, books and other property of the Society of value or suitable for future use; and shall exact from his successor an itemized receipt for said property, when same is transferred.

ARTICLE XII—RECORD OF REPORTS

The annual reports of the officers and of the auditing committee and all reports relative to the finances, or property of the Society, or the disbursements of its funds, shall appear in full in the record of transactions, in the order of their filing with the secretary following the record of the meetings at which the reports were presented. The treasurer's report shall be made to the auditing committee showing a full report of receipts and disbursements and said report together with report of the auditing committee shall be made a part of the proceedings.

Said reports may either be pasted upon said record, or copied, in which latter ease the copy shall be attested by the secretary.

ARTICLE XIII.

The executive committee may, if they deem it advisable, lend the assistance of the Society in any display of fruits and products of the state.

ARTICLE XIV—AMENDMENTS

New by-laws may be adopted and old ones changed or repealed by a two-thirds vote of the members present at any meeting; provided, notice of such proposed adoption, change or repeal shall have been given at the last previous meeting of the Society; and provided, further, that a vote to change or repeal Article X shall be by yeas and nays, recorded on the record book of the Society. Said vote shall be taken only at an annual meeting, and after due notice given at the annual meeting next preceding the same.

SECRETARY'S ANNUAL REPORT.

To the Officers and Members of the Oregon State Horticultural Society: I wish to submit my annual report of the Society for the year 1917. We had hoped to inform you that this year there would be an appropriation other than from our general funds to defray the expense of printing the annual report. However in the mass of legislation that was passed at the last session of the legislature in the attempt to pass a bill consolidating many offices which would have taken care of the Society and which was finally defeated, it was then too late to ask the separate appropriation and therefore it behooves us to do our utmost to assist the financial needs of the Society by promptly paying our annual dues and asking others whom we know are interested in horticulture to become members, either as annual or life members.

Since our last meeting I have secured five life members and I am of the opinion that if this Society had an additional 200 life members we would never have to ask the legislature for funds. The money obtained from the life membership is placed in the irreducible funds and only the interest is used for the Society.

Early in the year following the suggestion of your secretary at the last annual meeting an additional $10.00 was placed at interest to Mr. Newell. However, in June the entire note was taken up and all money obtained by Mr. Newell was repaid together with the accrued interest. This left us with the money on hands and after vainly trying to obtain a safe loan for same the trustees instructed your secretary to invest in the second Liberty Loan. This was done and the Society now holds $2500 in 4 per cent bonds of the second Liberty Loan.

There is now on hands $953.30 in the general fund while the irreducible funds have been increased $50, and now amount to $2893.50. This does not include any membership fees for 1917-18.

Since the printing of our program death has taken from our ranks one whom we all dearly loved as a horticulturist, friend and brother. I refer to H. M. Williamson, the honored secretary of the State Board of Horticulture. It has been arranged that a memorial hour be given in eulogy of him and I am sure every horticulturist present will feel honored to participate in the occasion.

Prospects for the fruit grower are ever growing brighter, the government is taking active interest in securing markets and ascertaining market conditions in foreign territory for our products. Mr. A. P. Bateham, a trustee of our Society, is now in Japan and China alternately investigating market conditions and it is hoped that upon his return we will have some knowledge of affairs that will materially assist the Pacific Coast growers.

A member of this Society, and also a trustee, has had the honor of being appointed to the position of United States Senator. I refer to Hon. Chas. McNary. He, too, is looking after the interests of the Oregon fruit grower in congress. Prices have been better the past year and as the whole people become better acquainted with quality fruit our horticulturists will begin to reap the rewards for which they have so long labored.

Respectfully submitted,

C. D. MINTON, Secretary.

FINANCIAL STATEMENT.

Irreducible Fund.

Lambert Fund	$ 100.00	
Hoskins Fund	2,000.00	
Cardwell Fund	218.50	
Life Membership	575.00	
		$2,893.50
Invested as follows:		
Note J. R. Cardwell	$ 50.00	
U. S. Liberty Loan Bonds	2500.00	
Ladd & Tilton General Fund	343.50	
		$2,893.50

General Fund Receipts.

Balance on hand last report	$1,227.44	
Interest on savings	13.46	
Interest on Newell note	34.65	
Interest on Newell note	42.87	
Payment of Newell note	3,300.00	
Transfer savings account	493.50	
Annual memberships	75.00	
Life memberships	50.00	
Filing fees (from Newell)	2.80	
		$5,239.72

Disbursements.

Pacific Telephone and Telegraph Company	$ 2.45	
Statesman Publishing Company, printing	263.77	
Portland Trust Company, rent for vault	10.00	
Irwin-Hodson, badges '16, '17	35.00	
H. C. Browne Co., printing	3.75	
Washington County Recorder, fees	2.80	
W. K. Newell, new loan	1,000.00	
J. L. Hartman Co., bond	7.50	
Northwestern National Bank, government bonds	2,500.00	
Staples Jeweler, engraving	6.00	
C. D. Minton, compiling minutes	35.00	
C. D. Minton, expense meeting Hood River, Salem, stenographer etc.,	37.45	
Ladd & Tilton	.09	
		$3,903.81
Balance		$1,335.91

Trial Balance.

Cash on hands	$1,335.91	
Loss and gain		$1,345.26
Lambert Fund		100.00
Hoskins Fund		2,000.00
Cardwell Fund		218.50
Life Membership		575.00
Government Bonds	2,500.00	
Supplies	9.35	
Bills Receivable	393.50	
	$4,238.76	$4,238.76

We, your committee, duly appointed to audit the books and accounts of Mr. C. D. Minton, the secretary-treasurer of the Oregon State Horticultural Society, hereby certify that we have this day examined all books and records submitted to us and find the same in order in every respect covering the year ending December 31, 1917.

We also certify that the cash on hand, as shown by the Trial Balance, is on deposit with the Ladd & Tilton Bank.

Portland, Oregon, January 17, 1918.

ALBERT BROWNELL,
J. B. PILKINGTON.

REPORT OF MEETING

THURSDAY, DECEMBER 6, 1917

Meeting called to order at 2:30 p. m.

President: In the absence of Senator Chas. McNary, who has left for Washington, D. C., the welcome address will be made by Governor James Withycombe.

Governor Withycombe: I am glad to be here and to welcome you. It is a great moment for men to do things. It is the men who have vision and courage, that survive difficulties when dark clouds hang above.

I remember the first meetings this Association held in this city, some years ago. There are but a few of those attending that meeting who are here today. I believe Mr. Park and Senator LaFollette are the only ones here today.

To my mind this is the time of all times when we should stand with the horticultural industry. The main reason is that the fruits of the soil are very important and it is a patriotic duty to come forth with a supreme effort to produce all we can from the soil.

There is at this time a tremendous opportunity for the loganberry growers. Approximately $180,000 has been spent in furthering the industry, and if we are going to reap the harvest, we must get busy and give that movement our support. It is an industry that is here to stay because nature has made it possible to produce a marketable crop. There are ten to fifteen millions of acres in the central-western counties of Oregon and some localities in Washington adapted to the growth of loganberries. There is no reason why we cannot make this industry worth many millions.

There must be more production and strict conservation, and some plan must be worked out for the conservation. I believe there is grave danger of a famine. America will be the main factor in solving this great problem. Horticulture is one of the factors."

President: I am sure we have all listened with pleasure to the governor's talk. I wish to apologize for the small attendance today. The first day is usually taken up with business and that accounts for the small attendance. The next thing on the program is the welcome from the Horticultural Board, by Mr. Chas. A. Park.

ADDRESS OF WELCOME FROM HORTICULTURAL BOARD

By Chas. A. Park, President, Salem, Oregon

Mr. President, Ladies and Gentlemen of the Oregon State Horticultural Society: I deem it an honor to represent the State Board of Horticulture upon this occasion and on behalf of the State Board of Horticulture, I extend to the Oregon State Horticultural Society a cordial welcome to its 32nd annual meeting.

The Oregon State Horticultural Society has been engaged in a noble work in this state. It has been composed of men engaged in horticultural pursuits, who have voluntarily associated themselves together for exchanging their ideas and experiences in fruit culture, so that any may benefit by accepting the profitable methods of some and avoiding the serious mistakes of others.

A few years after its organization, the members of the Oregon State Horticultural Society realized that it was imperative that the state should exercise some police power over the fruit interests of the State, so they brought about the formation of the State Board of Horticulture through the state legislature in 1889. Thus is the State Board of Horticulture a child of the Oregon State Horticultural Society, and it is always in order that the State Board should stand attention in the presence of the State Society, who molds the sentiment which makes it possible for the State Board to perform its function.

I wish to say a word of appreciation for the work of those who first formed the Horticultural Laws of Oregon. They did not set up an elaborate machine, but they did evolve a scheme of control that was simple and effective. No tempting emoluments were hung up for grasping time servers, but compensations were placed so low that nobody would be interested except those who would willingly give their services for the benefit of horticulture at large. This first horticultural law has been amended many times, not by tearing down the basic principle upon which it was built, but by adding strength to its details as conditions changed by reason of the growth of the fruit interests in the state. The horticultural law as it now stands on our statute books is the result of twenty-nine years of experience in the practical working of the law in its relation to fruit culture.

It has always been a principle of the State Board of Horticulture to exercise its police power within reason and common sense. It has endeavored to instruct the fruit grower rather than to drive him. When necessary, the Board has not hesitated to call into action some of the most drastic measures of the horticultural law.

Concerning the fruit and vegetable pests which are not as yet in this state, the Board is ever on the alert to keep such from being introduced in our midst. On several occasions the brown tailed moth has been found on shipments of nursery stock imported from France and they have been destroyed before getting a lodgment with us. I will not venture to say what damage this one pest alone could do in our state. I will say that the state of Massachusetts has expended millions of dollars to control this one pest that has found a footing within its borders.

The tuber moth is another pest that the Horticultural Board is ever on the alert to keep out of Oregon. This moth is the producer of a small worm that attacks potatoes and allied plants. It is very prevalent in California, so much so, that we have placed a restricted quarantine on all shipments of potatoes from that state. We intend to place an absolute quarantine on all shipments of potatoes from California which are sent into this state for seed purposes, this quarantine will be in effect before the next potato planting season.

These are only a few of the things the State Horticultural Board, your child, is doing for the state of Oregon. To hark back a little, the Board is the only police power in the state to protect the grower of fruits and vegetables in his endeavor to produce the best possible specimens of his culture. The fruit and vegetable interests of Oregon are no small item. It may be of interest to you to know that there was produced in Oregon in the year 1916.

3,000,000	bushels apples, valued at	$ 3,150,000.00
10,000,000	pounds blackberries, valued at	450,000.00
22,000,000	pounds loganberries valued at	800,000.00
1,350,000	boxes peaches, valued at	1,150,000.00
40,000,000	pounds dried prunes, valued at	3,000,000.00
These with other fruits in the list bring total value to		$12,420,000.00

Among the vegetables produced in this state in the year 1916 there was 30,000,000 pounds of cabbage, valued at $450,000; 11,500,000 bushels of potatoes, valued at $14,250,000. The value of all vegetables canned and fresh, brings the total of this division to $30,000,000. The grand total of valuation of fruit and vegetables amounts to over $42,000,000, which is no small item of wealth added to this state in one year by this branch of agriculture.

Gentlemen, these are the things that you are doing to help win the war. While we bid you welcome, we stand at attention and are at your service.

President: I would like to say before I read the President's Annual Address that I have been so busy with work in the office, part of which is not entirely work belonging to the Fruit Union, one thing being the Army Y. M. C. A., that I have not had the opportunity to give this subject the attention it really deserves, but I have prepared an article and I will read it.

PRESIDENT'S ANNUAL ADDRESS

By Robert C. Paulus

Another year has rolled by and we meet again to talk over things, some of which are old to us, some new to us, each of us comes enlarged by the experience which another year has added to our lives and hoping to secure the benefits of the experience of others which another year has brought them. It was a grand idea when this Horticultural Society was formed that these meetings were decided upon, as the interchange of ideas between men and their fellow beings has been responsible for the development reached by the human race up to this time, and these meetings afford the opportunity for the exchange of ideas along lines of vital interest to everyone interested in the fruit growing industry.

The fruit industry, which was so small in the state of Oregon some thirty years ago, is now one of its great revenue producing industries and affords occupation to many thousands of its inhabitants in the various industries of planting, growing, harvesting, curing and packing its products. The advantages of the state of Oregon over nearly every other state in the Union favoring the fruit growing industry are many. Some have been lauded to the skies in our press, a great many have not. The most advertised of Oregon's advantages has been her climate. The climate of Oregon, and especially the Willamette Valley, is most admirably suited to the growing of a great variety of fruits which yields a possibility for diversification, which is absolutely necessary for the solid foundation and permanent growth of any locality. A great variety of soils is also available. Sometimes, as around Salem, Oregon, the variety of soils is so great as to lend itself to the widest kind of diversification, which has resulted in the establishment in that district of numerous fruit and vegetable product plants. In fact Salem is the largest fruit and vegetable products producing section in the Northwest, and it is greatly due to the adaptable climate and the great diversification of soils that this has become possible.

Another great factor in the profitable production of fruits and vegetables is a low initial cost of the land. Oregon, with the exception of two or three localities, has not yet begun to feel the effect of over-inflation of land values so that it appears to me that our future is still ahead of us, and not behind us, as in some of the high value land sections. Lack of the necessity for irrigation in most parts of the state, which is an extra added expense to the cost of operation, also the lack of need of smudge pots with which to fight frost, should be another great factor to the advantage of Oregon's fruit industry, if the fruit bubble should ever burst and the industry not prove an interest paying investment in other locations where orchards are considered worth from $1000 to $1500 per acre. Some day the superior flavors of most Oregon fruits, which are the products of its wonderful climate, will be a great talking point in selling fruits.

In looking over the progress of the year we note great strides in some lines produced by various causes. Our neighbor, the state of Washington, has made great progress in fruit products plants, several large apple evaporating plants, vinegar plants, apple juice factories and fruit canneries, having been erected within the past two years. Demand has sprung up for thousands of tons of cull apples, quantities such as have never been used in the Northwest before. Part of this is the product of war conditions, and another part is caused by the failure of the apple crop in New York, and the short crop in several otner sections of the United States. A number of smaller canneries have been revived in Oregon and run again to take care of the demand caused by war conditions, and, although the crops of some fruits were badly cut down by the backward spring and extremely dry summer, the fruit industry as a whole may be said to have gone through a prosperous year.

War conditions have brought about a great many things which will, no doubt, act to the advantage of the fruit grower and farmer in future years. Take for instance the action of the government in regard to cutting out speculative profits and also to cutting down the margin between the grower and the consumer. It has been shown that in some products the grower gets only 35 cents out of the dollar the consumer ultimately pays. War conditions have caused the government to give this matter serious consideration, and there is no question that this difference can be materially cut down by the proper methods. The free advertising given by the governmnt to fruits and vgetables will, no doubt, stimulate consumption to a great extent.

The government is also taking more interest each year in helping the farmer and fruit grower. It realizes that upon the farmer depends the food and a great deal of the prosperity of the nation, and it must assist him in every way possible. It has sent its agents into every community, some to help the farmer to solve his cultural problems, some his market problems, and others his financial problems. His cultural problems are being looked into by the county agricultural agents which have been placed by Uncle Sam into nearly every section of the country. His markets are being looked after by the agents of the Bureau of Markets and Rural Organizations, who are also scattered all over the country. One of them is right at present located in Spokane, each day collecting from the railroads the number of cars of apples shipped, the destinations of the cars, any diversions of cars to markets other than the ones they were originally shipped to, and each day he is informed by wire from the agents in the various marketing centers of the prices that market is paying, the condition of the demand, the number of cars sold and the number remaining unsold each day. This information is each day gathered and summarized and put out into the form of a bulletin to the various growers' associations and other interested parties, so that the saving in the cost of getting this information by each association is tremendous, and Uncle Sam can get it better, too, as he has no cause for misrepresentation of facts, as is sometimes the case when a sales manager gets information from some commission house.

The government is also doing everything in its power to encourage the farmers and fruit growers to organize purchasing and marketing organizations. Any amount of information and assistance can be had from the Bureau of Markets and Rural Organization along that line. They have even gone so far as to get out suggested forms for a uniform system of accounting in fresh fruit shipping organizations.

Probably one of the biggest things the government has done for the farmer is the creation of the Farm Loan Association in accordance with the provisions of the "Farm Loans Act." This act has given the farmer the opportunity to get long time loans on his lands. One of the hardest things the farmer and fruit grower have had to contend with is the lack of long time money. On account of the enormous sums of money required by the banks in most fruit growing sections to finance the growers at the harvesting period of their crops, most of these banks have been unwilling to extend long time credit facilities to growers, and this has caused a great obstacle in the development of many young orchards until they become revenue producing. The new Government Loan Banks, through Local Loan Associations, which are being rapidly formed in each locality, now allow the grower to borrow 50 per cent of the value of his land and 20 per cent of the value of his improvements. The terms of the loan are such that the grower cannot pay it off before five years, but he has 36 years to clean it up in. By paying an amount annually, equivalent to 6 per cent of his original principal the loan automatically cleans itself up in 36 years. Any grower, however may pay his loan back any time after five years.

Having devoted most of this article so far to the things which have occurred to the growers' advantage during the past year, I will now divert the trend of the subject to some of the troubles we have had, mistakes we have made in the past, problems of the present and prospects for the future.

There has been a great deal of money lost, a great deal of energy and heart breaking toil wasted in the planting of orchards in the Northwest which through some cause or other have been found, when the orchards arrived at their proper bearing stage, to be unprofitable.

The causes for these conditions are many. Most important, however, has been the question of poor soil, poor location and poor drainage. A great many thousand acres of fruit have been planted on land which could not, by its very nature, produce an orchard and carry it to its bearing stage and produce good heavy crops year after year. Thousands of acres have been planted to fruit which is unsuited to it by the particular nature of the fruit itself. Thousands more acres have been planted on soils that have been planted to grain and other soil robbing crops for twenty-five to forty years before the trees were planted. It is inevitable that this land will produce a certain number of crop failures and fertility must be restored to the soil before the orchards can hope to be profitable. This method of planting is like putting a certain amount of money in a savings bank as an interest bearing investment but at the end of each year, instead of drawing the interest, you draw out one-tenth or one-fifteenth or one-twentieth of the principal without having put anything back during the year. You can readily see that at the end of the tenth, fifteenth or twentieth year you are not going to have anything left in the bank of your original investment, and all you will have left is the little interest that has been accumulating each year. This works the same way with an orchard. After continual cropping for 20 or 30 years without putting back into the soil any of the elements you are robbing it of you find yourself left with the few improvements you have put onto the place and a barren orchard which it is practically impossible to sell.

The next ten years will see a continually greater application of fertilizers on the orchards of this state. Other sections have had to do it and we will have to follow their methods if we hope to stay in the fruit business. In renewing fertility of the soil there are several different materials which will have to be tried out. The past three or four years have seen several experiments in fertilizing prune orchards with commercial fertilizer, but on account of the enormous advance in cost of some of the ingredients from which it is made there is going to be a scramble for our long time friend, common barnyard manure. Quantities of lime will also be tried out in various localities. Some nitrates will also, no doubt, be used as the government is at the present trying to get the cost of nitrates down by buying the nitrates for all the farmers, thus eliminating the competition which has been one of the factors in the price increase. There will also be a renewal of plantings of green manures, such as vetch and other leguminous plants.

In buying land for planting orchards the prospective grower should investigate carefully into the natures of the soils best adapted toward growing the fruit he wishes to grow. He should also look into the possibilities of drainage. Most fruits cannot stand wet feet.

There is room for a little investigation work in regard to cultural methods for the various kinds of fruits. Take prunes for instance, at the present time there is absolutely no uniform time among the prune growers for plowing. Some growers plow late in the fall and disc in the spring, others aim to plow about a month and a half before blooming period, others two weeks before blooming, some during the blooming period, and others not until two weeks or a month after prunes bloom. Some growers wait until so late that the ground is very dry. There is room for investigation in this condition. If there is a "best time" to plow, or a better way to cultvate, we ought to know it.

In the cure and prevention of insect troubles and fungous diseases most of our inspectors are not giving us the scientific service which we have a right to expect for our money.

There is also a need in most sections of the state for more knowledge as to the proper time for picking various fruits. Most growers who handle apples on a large scale know that apples, if left on the tree too long, exposed to the action of the sun, will ripen a great deal faster than if picked and stored slightly green, and deterioration starts in a great deal earlier necessitating a quick movement of the apples to the market, flooding the market and breaking it down when it should be the strongest if it does the grower any good. In the picking of prunes it has also been shown by experiments that the sugar content of the prune (which is one of the main factors in producing weight) increases rapidly in the last few days of ripening on the tree. Using the weight of dried fruit as a basis, the Oregon Agricultural College has found that in some instances a loss of 6 per cent of the total weight of the crop was caused by harvesting too early. In addition to this the immature prunes dried away more than the ripe ones. This resulted in an additional loss of 6 per cent in his crop, making a total loss of 12 per cent, or a monetary loss of $15 a ton, due to too early harvesting. Many of us, in our eagerness to get our prunes harvested before bad weather sets in, shake our prunes from the trees before the sugar has had sufficient time to form and we cause ourselves considerable loss on that account. Quite a number of growers noticed this condition this year and have spoken to me about it. The Oregon Agricultural College made some experiments along this line and have some interesting information on the subject in their bulletin entitled "The Evaporation of Prunes."

In the evaporation of fruits and vegetables some progress has been made during the past year, although it is probably a larger advance that has been made in this industry for five or six years. With our geographical isolation from the center of population, which must necessarily be our major market, as it is impossible for us to consume all we produce, and with our consequent high freight rates, longer time getting our fresh fruits and vegetables to market, and also the continual presence of a car shortage during our most important shipping season, there is no question but that the Northwest is going to have to depend more and more upon fruit and vegetable products plants to take care of a great share of its products. This is also true with California, which is finding itself each year more handicapped by the lack of shipping facilities. There will, no doubt, be considerable progress along the fruit product line in the next ten years. Personally I do not think the Northwest has been hardly any more than scratched yet. I expect to see many more large canneries in the districts where diversification is possible, large preserving concerns will, no doubt, establish branches here, and with government agitation in favor of dried fruits and vegetables I think the opportunity for the Northwest has arrived. Never has there been a more favorable moment for the development of this fruit and vegetable products business than now. With the enormous prices of canned goods, the shortage of fresh fruits and vegetables on eastern markets, caused by car shortages and demands from canning concerns, the condensation in weight of the evaporated product, due to evaporation of moisture, the fact that the evaporated product will keep indefinitely, consumes little space, and many other equally as good arguments, there should be a great stimulation of the use of these products.

I saw an article a few days ago quoting E. Clemens Horst, the hop man who has been evaporating considerable quantities of vegetables in California this year. The following is an extract from the article referred to:

"The general adoption of dried vegetables instead of canned stock will, to a pretty big degree, solve the car shortage troubles of the country, as it will require 167 cars to transport the same food value of canned vegetables as for a single car of dried stock. This estimate is based on the following figures: That it takes 52 cars of canned vegetables to equal one of dried stock; that the transportation of empty cans necessitates another 52 cars, that the lumber used in the box shooks for this amount requires 23 lumber cars; that the tin (hauled raw) in the cans needs six and one-half cars, and that the other materials will use up ten cars," according to the report. Mr. Horst has succeeded in getting the new Willard Hotel at Washington and the Biltmore and Manhattan in New York City to use his evaporated vegetables, and the Everbest Co., of Sutherlin, Oregon; Wittenberg-King Company, of Portland, and the Dayton Evaporating Company, of Dayton, Oregon, have been doing a great deal of hard pioneering work in introducing exaporated vegetables to the Eastern trade.

In the drying and packing of prunes I believe some improvements could be made. In the first place nearly all growers could use more water in dipping; also, less lye. To anyone who has packed prunes for some time the difference in the appearance of a packed prune which has been heavily lyed and one which has not is readily discernable. The prune on which little or no lye is used makes the prettiest pack, and if the prunes are lyed too heavily it sometimes causes a great deal of extra work on the part of the girls who face the prune boxes, as the skins break so easily on the prunes which have been dipped in too strong lye solution.

There should also be more care taken in the evaporators in drying prunes. In the endeavor to do as little picking over as possible prune growers often dry the majority of their prunes unnecessarily hard. This is caused by leaving the trays in the dryer until practically all of the largest prunes are dried. The smaller prune, on account of its size and smaller moisture content, reaches a sufficienly dry state first, and if left in the dryer until the few large prunes are ready to take out often becomes unnecessarily dry and the grower loses the difference in weight. This is true with a great many lots of prunes. I think the extra cost of picking over the prunes a little sooner would be way more than offset by the more uniform quality of prunes put out. It might even pay to run the prunes over a hand grader and take out the larger ones and dry them separately from the smaller ones.

There has been a great deal of talk about standardization in the past four or five years, and last year the government stepped in and has taken a hand with the result that we now have a uniform standard potato grading rules for the United States. A standard for oranges has also been made, and the government is now working in conjunction with producers, shippers and buyers in an endeavor to make a uniform standard of grading on apples. In dried fruit they have set a standard moisture content on dried apples of 27 per cent. For the navy department the standard has been strengthened until now only 24 per cent is allowed. A content of not to exceed 30 per cent moisture has been set on the California prunes the government is buying. It would be a good thing for the dried prune business if a uniform moisture content were established for all packs of prunes. Neither a packer or a grower could then put out fruit which would spoil and be a detriment to the business. No one would fight a ruling of this kind, except a man who did not want to do right, and the sooner that kind of a man is put under a rule the better the community will be off, as well as himself, as it would in the end revert to his own good. There is no question at the present time that there is a more uniform method of packing dried fruits needed; especially as applies to moisture content.

One of the things in which Oregon is so far behind her sister states is statistics. There is a woeful lack of statistics on everything pertaining to fruit in the state of Oregon. There are no records gathered or kept from year to year of the tonnage of the various fruits produced. There is no record of the packs of the dried fruit packers, the fresh fruit handlers, the canneries, fruit juice factories, and vinegar plants. There is no record of how many evaporators there are in the state. The whole statistics situation is in a very unorganized state. This work should properly be taken care of by the State Board of Horticulture, but they have either not the facilities or cannot legally demand the information or have some other cause for not gathering the information. At least it is not gathered, and buyers have to rely from year to year on guesses of individual packers or sales managers, which are never checked up and no knowledge as to their reliability is available.

Neither is there available any statistics on the amount of acreage of various kinds of fruits in bearing in the state, nor the number of acres of fruit coming into bearing. We who have to bear the burdens of finding markets for the various fruits are working in the dark. We have no way of knowing that an over-production in any certain line is coming and cannot prepare for it. When the over-production comes there are one, two, three or sometimes four years of deprivation, want and suffering before the situation is straightened out, and often a growers' organization in an attempt to save the growers' orchards for them, stretches its credit so far as to be unable to stand up under the load.

In California the state has an accurate line on the number of trees planted, in bearing, and non-bearing of each variety and in each county, and in instituting methods to take care of over-productions before they arise, the state of California has created the office of Market Director, and this commissioner has succeeded in successfully organizing nearly every branch of horticulture and agriculture in California, and the fruit industry in California is being well taken care of. The Raisin Growers' Association handles about 75 per cent of the crop in California, and although the crop of raisins this year in California was around 300,000,000 pounds, which is the largest crop of raisins they have ever produced, even some of the trade papers which oppose every co-operative effort, are admitting that the Raisin Company will be practically sold out of raisins by the first of the year, and the prices were considerably higher than last year, 1916, when the prices received were also $30 a ton higher on several varieties of raisins than the year 1915. The prune and apricot growers controlled 75 per cent of the 100,000 acres of prunes in California. It is claimed the peach growers control a large majority of the acreage in California; likewise the almond growers, the walnut growers, the olive growers, the honey producers, the poultry and egg producers are all organized into strong associations. California might aptly be called the "Land of Co-operation." Co-operation is the only salvation of the grower when he is in a hole, why wouldn't it work greater wonders for him when it does not have to work under the odds which an over-production puts on it.. I think the next legislature should take some action toward establishing a bureau of statistics of some kind. We have a large acreage of walnuts coming into bearing, but nothing is being done toward preparing a market for them. We have some advantages in walnuts not possessed by other states, and they should be made widely known just before our first commercial crop is harvested. One is the higher percentage of perfect meats found in Oregon walnuts, and another the superior flavor. There are probably other superiorities which would appear by comparison, but those two alone would be a great advertisement. I have had brokers in the East, who have seen and tasted Oregon walnuts, ask me to be sure and put them in touch with some handler of Oregon walnuts when they became available in commercial quantities.

There have been some plantings made, and there should be considerable more experimental work done on new varieties of fruit for our soils. For instance, Senator Chas. L. McNary and his partner, Walter Stolz, have planted several acres of the California Imperial prune on some of their river bottom land. They are now planting an improved strain of California French prunes and also some Myrtle Creek selected Petite trees. They are doing this with the idea of learning whether the larger sweet prune will grow just as readily in our climate and if so there will, no doubt, be heavier plantings of these varieties in the future. But these experiments should not be individual in nature. They should be conducted by the state for the general good of the fruit industry.

With federal assistance, which we have as much right to as they, California has developed by importation, acclimation and seed selection, a great many agricultural industries which were once entirely foreign to her soil. The enormous growth of the rice business in California is only one instance of this extension work.

In closing I wish to say this, that there is at the present time in Oregon, with a possible exception of apples, a permanent demand for practically all fruits far in excess of the supply. Canneries, juice factories, vinegar plants, and evaporating plants are in the market with term contracts for thousands of acres of berries and larger fruits, the prices being paid are the highest in history, almost anything the grower can grow finds a ready sale, and never has the future of the fruit industry in Oregon looked as bright as now, and if the growers of Oregon use the same methods of growing and caring for their fruits that have brought such big returns to growers in other sections I can see no reason why Oregon cannot beat the world with her products.

In selecting the subjects for this meeting, we realized that the greatest attendance would be from neighboring territory, so we tried to arrange a program which would be both of strong local interest and also of interest to those who come from other sections of the state.

I am sorry to say after looking over the membership of the Society, that there should be a great many more members from this district, and I hope to see a great many join before the session is over.

President: The next order of business is the reading of the minutes.

As the minutes of the last meeting had been printed and distributed to the members, on motion the reading was omitted.

Secretary C. D. Minton then read his annual report.

A motion was made, seconded and carried to accept the report.

President: I think it is also in order to endorse the act of the trustees and secretary in purchasing Liberty bonds, and I believe we owe Mr. Minton a vote of thanks for looking after these loans which have been made. Motion made, seconded and carried, to this effect.

President: The next part of our program will be devoted to a memorial hour for Mr. H. M. Williamson, late secretary of the State Board of Horticulture. I will call upon Mr. H. B. Miller to act as chairman at this time.

Mr. Miller then accepted the chair and after a brief address relative to the merits of Mr. Williamson called upon Henry E. Dosch to give the memorial address.

IN MEMORIAM

To the Officers and Members of the Horticultural Society: You kindly deputized me to say a few words for our departed friend; while it is a sad duty, it is a privilege and honor to comply with your request, especially as I have been associated with them for a great many years, in a work of vital importance to the Oregon horticulturist.

Dr. J. R. Cardwell, Dr. O. P. G. Plummer and Mr. H. M. Williamson; these three generals in horticulture stand at the head of the list of our departed fruitgrowers.

While I deem it a high honor and privilege to be permitted to pen these lines, I feel that it should have been assigned to an abler mind to do justice to the brilliant career of our departed friends. Hence I approach the subject with timidity and can only speak as a friend would and should of friends for I claim that sacred privilege of many years standing.

In an address on "Early Horticultural Days in Oregon," Dr. J. R. Cardwell said:

"You scarcely realize the high ideals, high hopes, the fine feeling and earnest work of the pioneer fruit grower. We were just as earnest, ambitious and hopeful as you are today in apple growing. A fine feeling and friendly, laudable spirit of rivalry was the spirit of the time. There was a true companionship and bonhomie in the work in a new country so far away from home and friends and relatives and all that has been dear to us—truly the experimental stages of the fruit industry."

This expressed the finer feeling, the noble aspirations and love for our fellowman with the Doctor himself, as he felt and worked and could not conceive that anyone could possibly do or feel otherwise; for his loving, kindly, trusting and confiding nature, judged everybody by himself.

Perhaps few men had the pleasure of the insight into the Doctor's horticultural soul more than myself, having knew members of this society from its inception thirty years ago and also as the first commissioners of the State Board of Horticulture appointed in the year 1889; where we served side by side for over thirteen years for the good of the fruit interest. We elected the Doctor as its president in recognition, not only of his mastery of horticulture from a scientific stand point, but because of his wealth of experience and the practicability of his ideas, a position he held for thirteen years.

What I have said of Dr. Cardwell applies in a great measure to our dear friend Dr. O. P. G. Plummer.

No one could know him without that sincere feeling of love, respect and high estimation of his sterling qualities; a man of the people, he was a true friend and ever ready to give aid and his best advice for the good of the questioner, and never was too busy or tired to give the best within him. He departed from us several years before Dr. Cardwell and the void left behind has not yet been filled and it will be many years before it will be filled. His life was full of cheerfulness and serenity; a man of the old school.

Dr. Plummer and myself were very old friends, coming to Oregon from San Francisco on the same steamer, landing in Portland April 9, 1864; in fact he and his family crossed the plains just fourteen days ahead of our train, walking all the way from Omaha to Sacramento. He was vice-president of this society under Dr. Cardwell from the very beginning for over twenty years and it depended on us few to build up this society to its present efficiency. Like Dr. Cardwell he was a pioneer in prune culture and to these friends we owe the high standard of the Oregon prune in the markets of the world.

Only a few days ago we carried our friend H. M. Williamson to his final rest, which we did last Saturday, and few eyes remained dry during the solemn ceremony at the chapel, for he was beloved as dearly as our other friends gone before.

Mr. Williamson came to us some thirty years ago and established an agricultural and horticultural paper; he was a frequent visitor at our office and soon allied himself with us. The columns of his paper were always open to writers on horticultural subjects and while we did not always agree his criticisms were in a spirit of kindness and justice, and in his editorial columns wrote those masterful and forceful articles so well remembered by us all and which were always for the uplifting of the horticultural interests. He shortly followed me as secretary of the State Board of Horticulture in which position he found his ideal and best expressed in an editorial of the Oregonian to-wit:

"H. M. Williamson, who died last week will be missed by progressive horticulturists, who always were certain of receiving his support and sympathy in any of their efforts to improve their industry. He was a mine of information for those who plant and tend trees, and in his receptiveness to new ideas he was especially young. Although excessively modest and retiring, he did a vast amount of good, and Oregon is poorer now that he is gone."

Yes Oregon is poorer now that he and our other friends are gone. The people of Oregon owe a great deal to these pioneers in horticulture, a debt which in these days of commercialism is lost sight of. Those who laid the firm foundation upon which the wealth of our grand state has been built are apt to be forgotten, hence it is due and meet that occasion like today arise to keep fresh and green the memory for years to come of those to whom we owe so much.

These generals in horticulture were true disciples of Carlyle, who said:

"You can help your fellowman. You must help your fellowman. It is a duty, nay, even a divine privilege to lighten the burden of our fellow laborers by giving them the results of our best thoughts and experiences."

Mr. Miller: I want to call now upon Mr. Park, who was the president of the State Horticultural Board and who is perhaps as familiar as any one here, with the splendid qualities of our friend, Mr. Williamson.

Mr. Chas. Park: There is not much I can add concerning Mr. Williamson, but speaking for the Horticultural Board, we appreciated Mr. Williamson's worth and character. He was an honest man, honest in the expressions he expressed. He never deceived himself, neither did he deceive his fellow-men. The Board always felt any proposition put up to him would go through. To Mr. Williamson is due largely the horticultural law. He carefully went over this, and I think in no instance has this law ever been questioned.

When Mr. Williamson came to us first, he was editing a horticultural paper. He was always in attendance at our meetings and was not always looking for subscribers to his paper, however when he attended the meeting, he would bring a number of copies and lay them down on a table near the door, so that they might be taken, without anyone knowing who had placed them there. When he became secretary of the Board he closed his paper, so that no one would be offended.

Mr. Williamson had a fund of information. If you asked him about any topic concerning the production of the country, he could tell you more about it in less time than anyone I ever came in contact with. Such men as this it is indeed hard for us to lose, for their loss is keenly felt, and the only thing we can do is to brace our shoulders to the storm and go to it.

Mr. Miller: I see several of the members of the Board whom we would like to hear from.

Dr. C. A. Macrum: It has been my pleasure to associate with Mr. Williamson on the Board for several years. I knew him ten or fifteen years before that time. One thing that always impressed me was Mr. Williamson's extreme modesty. His orderly mind was filled with facts, properly labeled and stored away, to be brought forth as occasion demanded. There was practically nothing you could ask him regarding fruit growing that he could not tell you. Although Mr. Williamson was a modest man, he was still a man of action. I have seen him in action once, and I must say that I admired him fully as much in action as in repose.

Mr. Miller: The meeting is now open to anyone who has anything to say on Mr. Williamson's life.

EULOGY BY GOV. WITHYCOMBE.

The following communication was read from Gov. James Withycombe:

Our departed friend, H. M. Williamson, was truly one of nature's noblemen, one of the most honest of men and yet the most helpful and efficient. He has been a factor in this state for a number of years in his quiet, inostensible way. He was one of the best editorial writers along the line of horticulture and general agriculture the state has ever seen. Always ready for service to humanity and his state. A most kindly man, a Christian gentleman, unselfish to the extreme but firm as the Rock of Ages when his mind was thoroughly made up. A man of noble impulses and high ideals, unblemished character, and his demise is a distinctive loss to the commonwealth of Oregon.

JAMES WITHYCOMBE,
Governor.

C. D. Minton: I move that we rise and have a moment's silent mediation to honor Mr. Williamson. Motion carried and the members arose and stood for a moment with bowed heads.

Mr. Miller: This closes this part of the program.

President: I think this closes all the program we have this afternoon. Tonight in the auditorium of the Commercial Club there will be a reception given to the members of the Horticultural Society and the members of the Commercial Club, by the Salem Women's Club.

Tomorrow afternoon we are going to call the meeting at 1 o'clock and we want to get the meeting over in time to give those who are from other sections of the state, an auto ride in the surrounding sections of of the country around Salem. I believe it would be well for those from out of town to register with Mr. Minton.

President: I wish to say a few words in regard to the gavel which was presented last year by Mr. Quarnberg. I will read the paper read by Mr. Williamson at that time, from the minutes of the meeting last year. Mr. Paulus then read from the printed minutes of the last meeting the paper by Mr. Quarnberg.

Mr. Minton: I would suggest that a committee on resolutions be appointed at this time.

President: Motion made, seconded and carried that a committee on resolutions be appointed, and I will appoint Dr. C. A. Macrum, Col. H. B. Miller and Dr. C. H. Bailey.

President: If there is nothing further to come before the meeting, motion will be in order to adjourn until tomorrow morning at 9 a. m. On motion meeting adjourned.

FRIDAY, DECEMBER 7, 1917

Meeting called to order at 9:30 by President Robt. C. Paulus.

President: It has been suggested that we salute the flag before we take up our meeting. All arose and gave the salute. The first matter on the program is an article by Prof. A. G. B. Bouquet, Chief of Vegetable Gardening, O. A. C.

Prof. A. G. B. Bouquet: Prof. Lewis wanted me to announce a number of things here today. Next Monday morning there will be started a Pruning School at O. A. C. which will last all the week. You are requested to give this publicity wherever you are and to encourage those who wish information and discussions of their ideas, to come to this school.

During Farmers' Week of this year we shall have three Horticultural Conventions. One day will be given up to By-Products, there will be a two day Nut Convention and a two day Vegetable Grower's Convention. In our vegetable convention we shall endeavor to consider the commercial grower as well as the home gardener.

Prof. Lewis asked me to express to you an invitation to come to Corvallis next year. I wish we could have this convention at Corvallis when we have our Horticultural Show, but it is not possible for us to have our show when you would normally have your convention, however, it would be a splendid thing if we could meet during Farmers' Week, as many of our other organizations do meet.

GROWING VEGETABLES FOR THE CANNERY AND EVAPORATOR.

By Prof. A. G. B. Bouquet, Chief of Vegetable Gardening, O. A. C.

Time was when vegetables were of minor importance in the packing of various horticultural products in canneries, and more recently in evaporators. The packing of a few vegetables was done between the handling of fruits and so helped to keep the plant running more uniformly and somewhat enlarged the output. This situation has now been considerably changed, for the quality of Oregon products being more widely and favorably known and with vegetables playing an important part in the feeding of the warring nations, there has been increased activity in the vegetable market and the packs in all canneries have been greatly enlarged. At the present time the Oregon output is of considerable importance, and offers to the vegetable grower a market for all or part of his crop which formerly did not exist. Vegetable growers are interested in the welfare and advancement of the canning and evaporating industries, for they have made it possible for them to grow many tons of perishable produce and many growers have been in a large measure dependent upon the factories for the sale of their products.

In view of the somewhat limited opportunities for marketing fresh vegetables in the markets of the state, the cannery and evaporator have stimulated production in districts where they are operating and elsewhere, and in case of a glut on the market of a certain vegetable this crop could be diverted to a factory handling it for the purpose of processing it.

With some crops such as celery there is a great amount of waste due to the strippings of the stalks in the preparation of the bunches for the crates. I saw in a celery field recently strippings which I later figured to be worth not less than $200 to the grower at the price ordinarily paid for celery, namely $30 per ton.

In the case of some other crops such as onions, the smaller bulbs which may be graded out for lack of size would make just as good onions for dehydrating as the larger bulbs. Cabbage that is burst slightly will be as fully acceptable as that which is solid if the cabbage is going to the kraut factory.

Oregon has already made a reputation for itself in the vegetables which it has packed and is packing. A letter to me recently from a cannery manager here in the state reveals the fact that, according to one of the best authorities on the subject, the Northwest will be looked for in the future for the largest amount of string beans in the country.

What is true of the quality of the beans is true of practically all of our canned vegetables. Premium prices, or prices above par, have been paid for Oregon products. The growth of the industry is on an upward grade and undoubtedly will continue in its growth.

As far as the success of the cannery or evaporator is concerned it is necessary, for the greatest economy to have the same located in an area where vegetables of all kinds may be suitably grown. A strictly fruit growing area may not be well suited to vegetables and vice versa. Some of our best vegetable growing districts in the state are at the present time producing little fruit, so that the factory may not always be able to be so located as to be supplied with both kinds of products from nearby territory. Growers should be able to receive more money if the majority of the produce is nearby grown, so that the factory is not put to the expense of paying costly freight bills as some of our factories are forced to do, going even into other states in order to get their raw material. In one instance one evaporator imported 200 tons of onions from California the past year.

Our problems in regard to this business do not lie in the ability of the soil and climate here to produce quality vegetables, if the grower will do his part in proper production and delivery.

Where one knows the price that he will obtain for a certain crop and he is sure of the market where it is to be sold, growing a vegetable under contract will be found satisfactorily and ordinarily profitable, provided, however, the grower meets the conditions that are necessary for producing vegetables of good quality, obtains no less than a normal yield, and delivers the product in suitable condition. The success of the grower in these particulars and the prosperity of the factory are, therefore, two correlated factors. The success of the one cannot be accomplished without the success of the other.

Two important factors in profitable vegetable gardening on a contract basis or for a co-operative concern are: (1) The securing of a normal yield or more than a normal yield, and (2) the reduction of the items in the cost of production to a minimum. When no more than the contract price is to be obtained, it can readily be seen that to put this business on a profitable basis there must be obtained a certain tonnage which will offset the cost of production and give the grower a reasonable profit. I will refer to this proposition a little later on.

One of the greatest problems in the relation of the factory to the grower at the present time or at any other time is the amount of raw material that will be delivered to the factory by the grower. Very often this is a shortage rather than an oversupply. The factory management is never certain of their possibilities of securing their needs of the raw products. This uncertainty was well exemplified by this last season's pack, when due to the dry summer season and the late spring many vegetable areas failed entirely to deliver anything near a normal yield. One acreage of beets, for example, that normally would have given an average yield from 45 acres produced no more than would be obtained from 10 acres. In a similar way, another cannery found that the pack of string beans this year did not equal the output of last year although the contract of acreage was almost twice as large as in 1916. This shortage of delivery may be due to classes of factors: one controllable and the other uncontrollable. Unfavorable weather conditions are beyond our dictation, but we can have something to say about soil selection, soil fertilization, maintenance of moisture, planting and caring for the crop, and the conditions of the vegetables at delivery. Crop shortage is unprofitable to the grower and disappointing to the factory which relies upon him to fill a contract delivery, the plant in turn being looked to for a definite supply by the brokers or jobbers. The controllable factors affecting what kind of a delivery will be made and whether vegetables growing for the factory is profitable or not are some of the important problems which I have in mind.

Concerning the distribution of seed to growers, I do not doubt but that considerable care is used in getting the best that can be obtained. It is well to bear in mind, however, that merely the question of what variety is to be distributed is not entirely solving the seed problem from the grower's standpoint. Of great importance is the question of the seed strains, the quality of which may be good, bad or indifferent.

Recent field trials by Experiment Stations show that the differences in the yield and type of different strains of the same variety are caused entirely by the quality and breeding of the strain, to such an extent, that in growing cabbage, for instance, the marketable value of one strain would be worth twice as much as that of another, the poor strains not paying the cost of production of the crop grown from them.

Just what plan is to be followed in buying seed to secure the best is not for me to say here, but it is of the utmost importance that more attention be given to seed quality and seed strains which are to be given growers to plant.

The question of what beets your grower delivers to you is not so much of one whether he is growing Detroit Dark Red or Early Model or some other variety, but more of a question of uniformity of color and shape and quality, which are not characters of any one variety any more than may be brought about by the care in selection of a good strain.

It can not be too strongly urged upon factory managers to use every possible precaution to select seed of the highest quality for their growers. This part of the business lies in the hands of the factory. We must educate the farmer also to be willing to pay more money for seed that costs more money to grow and upon which is spent extra time and money in selection. It is well to realize that in growing a vegetable for market the cost of the seed is from 1-20 to 1-100 of the gross receipts. Here, then, is one of the smallest items in the cost of production and yet one of the most important. It is unreasonable for us to expect a high grade product at an unreasonably low price. It may not always be that the price charged and the quality of the commodity are commensurate, but as a general rule there is usually a suitable degree of parallelism between the two.

Going back for a moment to the question of a profitable yield, it is noticed that this has always been one of the reasons why in many cases growers have not made money in growing vegetables on a contract basis or for co-operative concerns. With beets at $25 to $30 per ton, it is necessary that there be a yield of two tons before the crop is paid for and profits are begun to be realized. It will cost approximately $8 per ton to raise the crop. If cabbage is grown there must be a yield of five tons before a profit is started, for it will cost approximately $6 to grow the crop. Ordinarily half of the gross receipts of a normal yield will equal the cost of production, although this will vary with the individual vegetable, but when the yield is above normal there is less cost per ton in production and the net receipts are greater. If good yields are necessary to put the vegetable business on a profitable basis, they can only be obtained by an observation of the following: (1) The proper choice of a crop for the soil or a soil for the crop. (2) Fertilization sufficient for the crop needs. (3) The best preparation of the ground for the seed. (4) Proper seeding and maintenance of the crop. (5) Giving the crop due attention and not considering it of minor importance with other crops that are being grown in such a way that the vegetable is neglected.

In any community where farmers are solicited to grow a few acres of vegetables for the factory, there are a number who, beyond the fact that they have had a home vegetable garden, have never produced vegetables on an acre basis. They do not realize the intricacies of vegetable growing as a business and possibly underestimate the necessary conditions under which a vegetable will best grow. Possibly it is taken for granted that farmer A or B knows just the best method of growing so many acres of beets, beans, carrots, or what not. After seed is furnished him he may or may not be left to his own resources of selection of land, best methods of fertilization and cultivation, etc. Is it not a wonder that our factories do as well as they do in getting a uniform product in view of the variation in conditions of growing?

The discrepancies, therefore, that are to be noted in the yield of vegetables and the profits made by a grower, are largely determined by the personal experience, and the attention he gives to his vegetable growing and the conditions which he has provided for growing the crop. Fortunately vegetable growing is no more than a one season business, at the end of which mistakes which have been made can be rectified in the next year's work. I was talking recently to a travelling man who is in the habit of observing field conditions closely, and who mentioned an instance of the difference in yield which he observed where the same crop was grown under like conditions. In this case the railroad cut a certain field in two parts. On one side of the track the yield was twice that on the other side. This was due to nothing more or less than the way in which the land had been farmed on the two respective portions of the track.

If the farmer is not a gardener by profession he may not fully understand the soil requirements for vegetables. He must study closely the relation of the soil to the vegetable and endeavor to harmonize the two. A Willamette Valley soil in good fertility may produce satisfactory yields of grain, but planted to string beans, beets or cabbage, or the like, the yield might be light and possibly unprofitable

Land that has been built up with manure or cover crops is the only suitable soil for vegetables outside of those lands that are naturally fertile. There must be quality, size and appearance and yield in the crop which cannot be done with soils of ordinary fertility.

Prof. Haskell took a trip through Maryland and New Jersey where they are growing vegetables on a large scale, and he found many instances of where land had been reclaimed. One man invested $6000 in a run-down farm of New Jersey and built up the land from cover crops. He owns a fleet of motor trucks and supplies the neighboring towns with vegetables. I believe the proposition of cover crops ought to be emphasized to farmers who are trying to operate on land not as good as it might be.

Commercial gardeners of the state, you will notice, are today operating on land that is slightly, if not very much, superior to the ordinary run of farm land, superior in texture either in natural fertility or by actual fertilization. Many general farms have pieces of richer land than found on the rest of the farm, areas of swale and organic matter, which if well drained and utilized will make big yields of the best crop. These are the parts of the farm that can be made most profitable by growing vegetables. There are many hundreds of acres of land of organic nature in the state which will in the future be largely used for vegetables marketed fresh or delivered to canneries or evaporators. Such land is exemplified by the Lake Labish district near Salem, and the many areas in Northwestern Oregon from Portland to the Astoria coast. These lands together with other Columbia acreages are highly productive, are easily worked, and have unusual moisture holding capacity. The amount of vegetables that could be produced on these lands ought to be fully sufficient to take care of the demand for such stuff by the factories. Cabbage, spinach, onions and celery can be safely counted on to produce large yields of these vegetables. Under most circumstances it would be possible to get two crops off the same area using spinach followed by cabbage or celery.

Such double cropping is possible when the soil is fertile and the first crop is a short season one. Early peas or beets make a good first crop to be followed later by late cabbage, or late string beans or possibly fall cauliflower.

Fruit growers and farmers who have as their specialty crops other than vegetables but who are putting in a small acreage for the factory will have to consider the factors which I have mentioned in regard to a crop for the soil and what they can best grow with the cheapest labor. Crops that can usually be grown between trees or that can be handled somewhat cheaply on land unplanted to orchard are potatoes, cabbage, squash, and possibly roots and onions.

In a recent visit to the cabbage growing districts of a certain county I noticed many soils which were planted to this crop which, in my estimation, should never have seen a cabbage plant set on them. Many of these soils were lacking in moisture holding capacity and general fertility.

If possible to select such a soil, the land for vegetables should be easy working, inexpensive to prepare, given to holding considerable moisture and reasonably fertile. If the soil of a farmer who is figuring on growing vegetables for a factory does not begin to compare favorably with these characters, it had better be planted to something else.

Last summer furnished a good illustration of the fact that no matter how rich the soil may be, its moisture was the determining factor in the yield of the same. With our dry summer the possibility of supplying the crop with suffiicent moisture is the dominating factor. In looking over the various cabbage fields which I mentioned there were but few in which there were normal yields of the same, the exceptions being in those cases in which the soil was of such a character, so as to hold an unusual amount of moisture. In some cases, it was the inability of the farmer, due to the season, to put the land in proper condition that was responsible for the losses. If moisture is the potent factor then thorough spring preparation of the land is necessary. Clods must be crushed if the fullest value of the moisture is to be held. The soil that will not crush and pulverize will not ordinarily make vegetable growing profitable.

The style of soil preparation for a grain bed will not suit a vegetable seed. Fall or winter plowing is to be encouraged and the soil in the spring should be stirred constantly from the time that it is workable until planting time. It is necessary to use skillful cultivation if big yields are to be obtained.

Soil fertility is one thing from the vegetable grower's standpoint and another thing from that of the general farmer. Good beans cannot be grown with the best quality and yield on prairie land. It takes a fifty bushel crop of wheat per acre to equal the amount of nitrogen and phosphoric acid removed by an average crop of cabbage, turnips, or onions, and the vegetables remove five times as much potash as the wheat in addition to a much larger amount of water. This means therefore that the yield is proportionate to the amount of available plant food that the soil has and its ability to conserve moisture.

In the delta regions cabbage yields have been running this year as high as twenty-five and thirty tons per acre, the cabbage selling for $15 f. o. b. shipping point. This high yield is due to a combination of the soil's qualities that I have just mentioned.

Manure is getting scarcer than it formerly was which makes it almost necessary that more vegetable land be cover-cropped and built up by green manures. In this way we can use much less manure than we have been using in the past. In a discussion of the subject, "Can Vegetables Be Grown Commercially Without Animal Manures," at the recent meeting of the Vegetable Growers' Association of America which I attended at Springfield, Mass., it was the conclusion of the speaking after visiting many areas where vegetables are grown for canneries, etc., that when the manure supply is short, light applications are wonderfully effective in rotting the organic matter of the green manures and increasing the availability of the plant food which they contain. A limited amount of manure, a cover crop, and fertilizers have brought results in numbers of cases. An answer to the above question was "Yes", for truckers and cannery growers. All over the country we find men who are doing it.

There seems to be somewhat of an aversion by some regarding the use of commercial fertilizers, but I do not agree with such an attitude, provided the soil conditions are studied and care is taken in obtaining a standard fertilizer. I am not here to say that the artificial fertilizer will make for increased yields in every case, but I know that in many regions where the land is being fertilized with cover crops the yields are being brought up through proper applications of some fertilizer that particularly fits the needs of the crop. It will be necessary, in every case, to check up on the value of the fertilizer to the crop. Very often the use of a small fertilizer will make all the difference between half a crop and a full crop or nearly so, with a resulting net profit which will be satisfactory after deducting the cost of the fertilizer. Time will forbid me from going into this part of the crop growing to any length.

The requirements of some vegetables as regards the amount of labor necessary to handle them is of considerable importance in determining what crop will be grown. The cost for labor in handling a crop will vary with the individual crop. One man, for example, can take care of twice as much an acreage of cabbage as of onions, and possibly one-third less celery than onions. The labor item considers not only the cost in growing the crop but also whether the labor is possible to be obtained. This is true in the case of growing string beans for the factory, in which case the profits of the crop are reduced to a comparative small amount if an expensive wage must be paid to pickers.

There must be careful inspection on the part of the farmer as to the character of the vegetables which are delivered. Toughening of fiber through long standing in the field or elsewhere causes the vegetable to lack the desirable quality. There is, in some cases, a tendency among some growers to allow their products to become too mature before delivery. Fancy stock for processing, therefore, is impossible to be obtained. If the majority of farmers do not pay strict attention to this factor in delivering there must of a necessity be a lowering of the entire grade and a cheapening of the product. This is not just to the grower who is careful about his stock at delivery time. The production cost is practically the same for either first or second grade, while the gross receipts may be 25 or 50 per cent less. In this regard, therefore, there must be the strictest co-operation. The grower must be given a fair price for his vegetables that will enable him with a normal yield to pay the cost of production and receive a fair interest on his investment. Likewise the grower sohuld endeavor to deliver good quality produce rather than try to get rid of poor, unmarketable vegetables. In matters of this kind, some growers have not always been fair for they have had a tendency to try to unload some stuff on the cannery which would not be desirable to process.

I have in the foregoing pages only touched upon some of the many phases of crop production. We can confidently expect that if care is taken in obtaining all available data before the choice of vegetables is made and if the grower will give them the proper care, there should not be a great deal of difficulty in getting satisfactory returns in the growing of one vegetable or another. I have endeavored to emphasize particularly the fundamentals underlying the success and trust you will accept these simply as subjects for possible discussion.

President: I think we have all enjoyed Mr. Bouquet's address very much. His remarks are borne out by experience. The facts of his article are apparent to all who have had anything to do with the canning of fruits and vegetables. We are urging people in Salem to be very careful in the planting of loganberries, in the selection of soils. We find in lots of cases there has been a mistake in the planting of berries, and it will be very unprofitable to the grower in that case. Mr. Bouquet's remarks along that line should be taken into consideration by every one. There are thousands of acres of the best kind of vegetable land in the Willamette Valley and along the coast and with our advantage in regard to the vegetable business, I don't see why Oregon cannot be known in a great way commercially, on account of the advantage we have.

I have been studying lately regarding soils and cover crops. I find that in Kansas many farmers have almost doubled the wheat production by early plowing. Plowing in July shows about 50 per cent increase in tests over land plowed in September.

Mr. Minton: You spoke about the strippings of the celery being worth $200. Could that be marketed independent of the hearts?

Prof. Bouquet: Instead of stripping the celery and leaving the strippings on the ground they may be crated up and shipped to the nearest drying plant, which in the instance of which I spoke, would be The Dalles. They pay $30 a ton for unbleached celery and the bleached strippings are as good if not better than the unbleached.

Mr. Minton: You spoke of the location of factories, or canneries. Do you think the way our state is situated we would do better to have several small factories instead of one or two large ones?

Prof. Bouquet: Where they grow a large tonnage of cabbage down on the Columbia there would be an opportunity for opening certain kinds of factories. There is no fruit and every possibility of getting vegetables. If a factory were put in down there to take care of spinach and late cabbage, a grower could make $750 to $800 gross on land in proper condition.

Mr. Parker: What are those crops we can raise two on the same land?

Prof. Bouquet: At the present we don't have very many crops that can be raised on the same land excepting peas and spinach. There is no money in spinach unless you can grow a big yield. Bottom lands will give big enough returns on one planting.

Mr. Bailey: How much of the vegetable land of which you speak is under irrigation?

Prof. Bouquet: The majority of this land that will be used will not be under irrigation.

Mr. Bailey: Would this year's difference in yield not have paid for an ordinary irrigating plant?

Prof. Bouquet: Yes, it would.

Mr. Bailey: Would more land yield two crops if they had irrigation?

Prof. Bouquet: Yes, I feel sure of that.

Mr. Minton: You spoke of importing onions from California. Can this be done, and freight paid, cheaper than buying here?

Prof. Bouquet: The onions came by boat, so came rather cheaply, and were of a low grade and probably were the off grades.

Mr. Paulus: The California market was badly flooded with onions and our onions were not ready yet.

Mr. Minton: That was an accident rather than a factor.

Mr. Paulus: It might not happen again for ten years.

Prof. Bouquet: It is happening in other states outside of California. It is not profitable for us to send so far away for our stuff, but would be more practical to put in a factory to take care of stuff at that particular point where it is grown.

Mr. Paulus: I agree with Mr. Bouquet it is a bad thing for us to haul things from other states.

Mr. Minton: It seemed foolish that Independence should raise the biggest part of the beets used in the beet sugar factory in southern Oregon. If Polk county was going to raise beets they should have had a factory there.

Mr. Paulus: I do not think the sugar beet factory was located in the right place in the first place.

Mr. Allen: These factories are not always located with regard to crop. That factory at Grants Pass was located as far as my knowledge goes, as a real estate speculation. We had sufficient land signed up at Medford for beets. Medford has the land to produce sugar beets. It was understood that if the most acreage was signed up around Medford we were to have the factory but there was a real estate deal which took it to Grants Pass and about three-fourths of the acreagle was repudiated on account of the change. The factories don't seem to take into consideration what they can get, but can they clean up a big amount and then let it go to pot. Another thing, we are constantly hearing lectures on diversification. If you diversify too much in a district you are going to get into the very condition that Prof. Bouquet told us is very detrimental. We are going to have too varied a crop. I think that the two propositions are identical. If we would specialize along certain lines, we will begin to answer this.

Mr. McDonald: Why do the smaller canneries not pay as much as the larger and is it possible to build up canneries throughout the state?

President: I think most of the canneries have been co-operative and have failed through lack of selling ability and lack of properly skilled knowledge of the canning business. Mr. Allen, of Hunt Bros. Cannery is here and will give us some ideas along this line.

Mr. McDonald: I want to direct my question to the manufacturer. Whether it is possible to manufacture these products in smaller canneries.

President: In order to run most any kind of a cannery you must have a diversification of products. From a grower's standpoint you might have a specialized production but from the manufacturers' standpoint you must have diversification. Mr. Allen can you answer Mr. McDonald's question?

Mr. Allen: Supplementing the remarks which you made along that line. The organization of a cannery is simple but if we run a cannery for a month in the year it is not possible to get the product on the market without expert workers, and it is impossible to pay the people for the entire year. There are a great many places that started canneries that have not had enough material and the matter has been thoroughly tested. It might be as long as the war lasted a small cannery could live anywhere. As it has been possible to market the things we have talked about. It seems there is a demand for everything produced but is that going to be the case in the years to come. A large amount of capital cannot be invested on a shoe string. There is an unlimited demand for vegetables but people looking ahead cannot say that there will be a continuous demand for those vegetables.

President: I see we have Mr. Ira Hutchins, manager of the Co-operative Cannery at Brownsville with us. Perhaps he can give Mr. McDonald some information.

Mr. Hutchins: I have been manager of a co-operative cannery a little. I am not strong on the co-operative cannery proposition. I don't believe it is a success as a general thing. There are a few cases of success. Mr. Holt at Eugene has certainly made a success. Mr. Paulhamus of Washington has made a success, but those are two cases out of perhaps a hundred. But we must say that they have more than ordinary ability in handling their people, not in handling their products. They have been so strong with their people that they have taken the things in their own hands and made a success of it.

The cannery at Brownsville has been in a way co-operative but we buy and pay absolute cash for our products. We don't pretend to work on a co-operative basis whatsoever. It is hard to operate canneries for a month or two and hold men for a year. I don't believe it would pay any community to talk of building a co-operative cannery. If you can get capital to build the cannery then they are going to make a personal effort. What is everybody's business is nobody's business, and that has been my experience with co-operative canneries.

President: I think that both of the above institutions started and had a good start without competition. As soon as heavy competition comes in the members don't hang together. It is readily apparent that it takes the same brains to run a small cannery as it does to run a large cannery. There has been a lot of poor judgment used in the past in starting co-operative canneries in fact the Willamette Valley is a graveyard of co-operative canneries. Newberg, Woodburn, Monmouth, Independence all had them, and the history of the co-operative cannery in the Valley has been a night mare.

Mr. McDonald: What I had in mind was whether it was advisable for the manufacturers of these products at the local point of production to build small canneries, rather than bear the heavy freight charges to these cannery centers. I wondered whether we are not drifting in wrong channels in making large investments in central canneries and then when the product becomes cheapened later on, it will be impossible to bear the heavy freight charge.

President: It might be profitable with a company who had an extremely large business to build small canneries. They could send their experts out to these canneries during the seasons and bring them to the main plant during the rest of the season. The first question of installing canneries is the location of the largest supply of products and the second is labor. It is hard to get labor to run a plant, as it must be expert, and practically all of the labor is required in the fields to keep from losing the crops. It takes nearly as many experts to run a small cannery as it does to run a large one. Then we must take into consideration the proximity of the cannery to the cans, etc. I know one of the loganberry juice factories was considering the advantages of Portland, and talked some of shipping the berries from here to Portland on account of the enormous cost of shipping bottles to Salem. Everything to be used in the manufacture of the juice carries a high freight rate and they had considered it might be advisable to put the plant in Portland. These are problems that each manufacturer has to solve.

Mr. Miller: One question especially I would like to ask. Would this ordinary ash and oak swale land answer for vegetable land? There is a great amount of that land throughout the Willamette Valley.

Prof. Bouquet: I think it would. There are some prominent farms that have considerable oak and ash swale land.

Mr. Miller: This question which we have before us to my mind is the most important question for the members of the Horticultural Society. Mr. Bouquet has said in his paper that we are beginning to make a reputation on our vegetables. It looks to me as though we are going to have one of the best states in the development of the fruits and vegetables. The future of Oregon lies in those crops.

The instance at Grants Pass I am familiar with. Most of these plants are put up through some type of a land selling deal. At Grants Pass it was a land scheme. The company did not make a thorough investigation of it and spent $200,000 or more in erection. If they had done that it would have made a success in that location. Irrigation in Southern Oregon is fundamental. That condition does not obtain here. In his paper, Prof. Bouquet spoke of the combination of fruit and vegetable plants. That is a great economic factor for it means a long season and that and diversification are the real elements necessary to the success of the cannery business.

There is another question I would like to ask. The mistakes which have been made have been due to the lack of investigation. We need a thorough investigation to decide where it would be advisable to establish a cannery. Is it not possible to get the Oregon Agricultural College to make a survey of that character to decide where it would be right to encourage those enterprises. It would inspire the people of this state. We spoke of the Eugene institution. The success of the Eugene institution is due largely to its location. Eugene is at the head of the Valley. There is the Mohawk, the Mackenzie, the Willamette Coast Fork; there are eight railroad lines centering in Eugene. It would be an easy matter to develop this country. What we need is an honest survey of the state. Would it not be possible for the Oregon Agricultural College to make a survey of that kind?

Prof. Bouquet: The principal reason for not being able to do this would be the lack of finance. I am sure such a thing would be possible, if funds were at hand. In irrigation and drainage it has been possible to survey many thousands of acres of land. I think the same thing would apply to establishing canneries. At the same time it will take lots of time and money.

I would like to ask one question. What assistance is given to the growers regarding methods of taking care of their crops, or do we confine our methods to meetings where not all the growers come. How are we going to educate these people? Do the canneries give them the education? Are we responsible or are we going to leave them to themselves. To get good stuff you must tell your men how to grow good stuff. Is it possible to distribute to these men, pamphlets telling them how to take care of their crops?

Mr. Miller: Both the canneries and the Horticultural Society should be active and help. The Eugene cannery lays that down as one of their fundamentals. I would not eliminate either one or the other. Both should use their best interests in that line. The canneries must take a prominent stand in that point. They must study the market as to what to grow and how to grow it.

I have thought a great deal about this subject and from one particular standpoint I am interested in Yamhill County. I came to the conclusion that the best place to locate a cannery was where you had good vegetable land and land where fruit can be produced. Those are the conditions where there is no doubt about the success. McMinnville has the Yamhill River with its bottom land where immense quantities of vegetables can be produced. There are the red hills where fruit can be grown. It has diversity of soils and conditions. Why is it not the business of this state to point out to the people these ideal conditions where it would be advisable to locate institutions of this kind. We are failing in our duty, when we fail to do this. I would like to see that duty placed upon the Oregon Agricultural College. If a thorough survey is to be made to point out the proper locations, I should like to see the college do it. It is one of the most important things that we can develop. In a few years from now it will be one of the leading industries in this state. The places in this valley suited to the production of fruits and vegetables are not taken advantage of, because of lack of knowledge. I think this Association should pass some resolution urging upon the college that such surveys be made. The important thing is to use good judgment and good sense for the furtherance of an interest that is bound to be successful if it is properly followed out. One of the big things is the development of the canning industry.

Mr. Witherspoon: May I ask Mr. Miller if the failure is not largely due to the fact tthat we diversify more than we should. In other, words the diversification that is going on is using all the surplus labor. We are turning our land over so fast we do not know today what we are going to do tomorrow. Farmers do not feel safe in planting a large quantity of anything on account of the labor conditions.

Mr. Miller: The gentleman is quite right from the standpoint of an unorganized method. If you will go to Eugene and study their system you will see that they study their local conditions. They know exactly what their market is going to be. The result is due to systematic management so that the energy will not be wasted. They know before they plant, what they are going to have a market for.

Mr. Chase: I think we hear entirely too much about Eugene. I want to hear Mr. McDonald's question answered about having small canneries. We have had call for a cannery on the Siuslaw. Most of our blackberries come from down there. It costs more to get them out after they are canned than to bring them out green. To put a cannery in there is out of the question. In Southern Oregon we started to raise tomatoes and can them there, but when we found the difference in freight, it put an end to that. It is out of the question to keep skilled labor unless the cannery can run all the time. This year we bought in a box factory to take care of our labor during the winter. There is a good deal said about diversification of crops. We try to do this with the grower so to get a number of different kinds of crops. We try to have a few men who have land adapted to potatoes, grow them and not grow beans and we don't want a man to plant 25 acres of string beans for the simple reason we know he won't get help enough to take care of them. We try to have a great many growers grow a small number of acres of beans. They can, in that way, take care of them. Of course, some fellows plant what they please. Regarding the matter of co-operative cannery, I am not very strong for these. I think one of the big things that made a success at Eugene was because a few men put their money into it and made it go. I think a co-operative cannery is a pretty ticklish thing.

Mr. Worsley: It seems Mr. Miller has struck the key note of this thing. I never knew a banker to locate his bank on an island. If the Oregon Agricultural College says to men of capital, that certain sections of this state are adapted to certain things, then those men would go and invest their money and start canneries. It depends upon the people of a locality whether you can show men of capital whether you can produce stuff there, and that it is the right kind of soil, then they will invest their money. I believe that our Association should recommend that the college make a survey of this nature. In our section of the state we have 40,000 acres of delta land. Our bench lands will grow loganberries. We want that assertion made in a positive way and I know capital will come there and investigate.

President: The same thing which applies to Eugene is true to Salem. It is true what the gentleman said about diversification. You can get too many irons in the fire. If you go into diversification you must get enough of each variety to enable you to put some work in on selling. A man must have a certain amount of each kind of fruit and vegetables, in order to make his run. You cannot make the run of one kind. I think the Wittenberg-King Company as well as the Salem Fruit Union and the loganberry juice people, are doing everything they can to see that a man gets his fruit on the right kind of soil. If they want vegetables they will go down to Lake Labish where we have thousands of acres of good land. The grower has to make money as well as the cannery man. One is dependent upon the other.

A. C. Allen: I want to ask where the information is to come from. The Horticultural Society is here not only to get, but to give information. We have found in Jackson County that you cannot mail the pamphlets to the grower and get him to read it. You cannot get him to attend the meetings to get an education. He doesn't want to learn. I don't know where he gets his information. This is an actual fact. Since 1915 Prof. Reimer has been carrying on fertilizing experiments in alfalfa. He discovered that the application of sulphur would make enormous increases in yields. When the first crop was growing nicely he gave a demonstration. He had a large number of one-tenth acre plots. They were fertilized with different solutions and each had a sign board giving the sulphur content. There was an old farmer who had been brought there, who had considerable acreage in alfalfa. He looked at the alfalfa on the treated and untreated soil, and said he'd like to know what these fellows were doing. He said he would like to know what secret they were using to make this difference.

There was another incident of a first crop of alfalfa which was eight inches high. After the land had been treated the alfalfa was over two feet high. They were telling of a woman who had a large acreage of alfalfa but who did not have money to purchase the material to treat her land. I said to a banker who stood near me that perhaps the woman could not get the money and asked him if he would advance the money in such a case, and he replied that he certainly would, that it was the best kind of a loan. How in the world are you going to get them to accept the information in any form?

Prof. Bouquet: I thought possibly some of the cannery agents would know how.

President: These meetings bring forth some good points. I have sent to the Department at Washington three or four times and received two or three mail sacks of literature and put it out in the office and it disappears. Maybe it is taken by men like the one that wrote to the Department that he liked their pamphlets—they made such good paper for starting fires.

Mr. Parker: I notice there are about three of the prune growers from Liberty here today. That is the way they attend.

Mr. Macrum: I would just like to make a suggestion in regard to the Oregon Agricultural College making a survey. What is the use of trying to get them to make it when they do not have sufficient funds? I think we should place the matter before the legislature instead of the college. This survey is not going to be made for nothing. The O. A. C. will do the best they can, but they cannot do it on wind.

Mr. Miller: Would it not be a better thing to let the matter go and then have it brought up before legislature?

President: Were you present at legislature when we tried to get an appropriation for lime for the farmers?

Mr. Macrum: What is the use of the Oregon Agricultural College trying to go ahead with the matter when they do not have the money? Legislature is the place we ought to go and we ought to get it. The fish business gets $200,000 or over a year, while the horticultural and agricultural gets about $5000.

President: It has been moved an seconded that the matter of survey be left to the Committee on Resolutions. Motion carried. The next matter on the program is "Orchard Fertility and Fertilizers," by F. R. Brown, County Agriculturist, Marion County.

ORCHARD FERTILITY AND FERTILIZERS

By F. R. Brown, Marion County Agricultural Agent

In his annual address yesterday the president of this Society stated that one of the greatest problems of the fruit growers today is that of soil fertility. He further stated that if Oregon is going to continue in the front rank of fruit producers, her orchardists must turn more and more to the use of fertilizers in some form. I should like to add to this statement the following, that in addition to soil fertility we must also consider more carefully the question of soil management, because any attempt to increase productivity through the use of fertilizers must fall short of its greatest attainment if the physical condition of the soils he made the best possible.

In a discussion then of orchard fertility and fertilizers let us remember the two important factors of plant growth emphasized by Hopkins in his book of permanent soil fertility. These factors are: its home and its food, both of which are largely under the control of orchardists.

The president referred to the fact that many orchards were being pulled out becuse of unsuitable locations. Every orchardist knows that the best home for a fruit tree is in a damp, well drained soil into which air will penetrate readily. Notwithstanding this knowledge we find many orchards growing on shallow soil, others on soils that are water logged, or made shallow through poor drainage; and still others on soils that through constant clean cultivation have lost their humus and have become hard and compact.

A few years ago the apple men of the Northwest were appalled at the ravages of a new disease. For a time it seriously threatened the fruit industry of Hood River and was the cause of a heavy annual loss in many other sections. This disease for a time seemed to defy all methods of control and since no definite organisms could be found that would account for its action, there seemed to be no way of combating it. For many years the common practice of those orchards would be to cultivate. Little or no attention was paid to replacing the plant food which was annually taken out of the soil by the crops. Since then cover crops and seed crops have generally been substituted for clean cultivation and the disease has passed, at least to the extent that it is no longer a serious problem.

At the present time the prune men are facing the fact that the older orchards have almost ceased to be profitable. Most of these orchards are now past 15 years of age and have suddenly ceased bearing profitable crops. In addition to this fact a thing which is more serious, if possible, than the decreasing production, is the steady increasing amount of certain physiological troubles which are now found in many of the orchards. I refer particularly to the brown of the prune at the pit, a thing which sriously injures the quality of the dried product. It, like the fruit pit of the apple, is apparently not caused by any disease organism and offers very little chance of control.

I mention these few facts so that we may get more clearly before us the relation of the physical properties of the soil to that other phase of the question—plant food. If you will go with me to those apple orchards where fruit pit is present, to prune orchards that are making little growth or producing fruit that turns brown at the pit, you will find those trees growing in soil from which the plant food particularly the humus has largely been taken.

It seems to me, then, that the first duty of the orchardist who plans to use commercial fertilizers is to place the soil in the best physical condition possible. This means that if the land is shallow it should be deepened if possible. If it needs drainage, that should be the first step in the planning of permanent soil improvement. If it needs humus in order to open it up, make it easier to work and permit the air and sunshine to work, to supply that humus in the most practical manner. Having done these things we will have insured the balance in the food supply, the presence of soil bacteria, those agents actively engaged in the releasing of plant food and a freedom from the toxic effect of the roots under a one crop system.

Plant Food.

From the result of all experiments in this state on a number of different varieties of fruit and after visiting personally a great many orchards where crop fertilizers have been used there seems only one conclusion possible where plant food is to be given directly to the tree. Only one element has given results sufficient to warrant its continued use, whether it was used on the apple orchards that had almost ceased to bear or on the prune orchards that were literally dying by inches. Nitrogen has always given results where applied in such a form that it became available early in the growing season. It would seem then that if we are going to use commercial fertilizers for our orchards, nitrate of soda or nitrogen bearing fertilizers alone should be used.

However since leguminous crops not only offers the possible source of humus which we so badly need but also has the power of taking the free nitrogen of the air into the soil we must consider them in our fertilizing work. This then makes the problem more complex, since there are other fertilizers which by increasing the growth of legumes adds to the fertility of the soil.

Lime.

The old truth "the lime stone country is a rich country" is one that can be appreciated where soils such as we have in this state vary in composition from 5 per cent calcium carbonate to acid conditions that require as much as eight tons of lime stone per acre. It is not practical in our orchards to apply large quantities of lime stone, particularly at prices offered at the present, unless we know that the returns for such investments will be adequate. However, since the interest in lime is so keen, it is not out of place to mention briefly the action of this element. Lime is commonly offered as ground lime stone, burnt lime, or hydrate lime. Ground lime stone contains 45 to 56 per cent calcium carbonate. When burnt carbon-dioxide is given off and calcium oxide remains. If hydrated, either by the manufacturer at a heavy expense or by the farmer at little cost, calcium hydroxide is formed. This when applied to the land absorbs carbon dioxide from decomposing vegetable matter and becomes again calcium carbonate. It seems then that no matter what form of lime is applied, the benefit which may be derived during any future time is due to the one compound, calcium carbonate.

These facts would seem to be sufficient to cause one to use the ground lime stone in preference to the caustic forms which are so disagreeable to handle. In addition to this, however, we find that burnt lime whether applied as such, or hydrate, is caustic. It is then a very powerful agent in the destruction of humus, and while this is desirable in a few cases, the humus in a great number of orchards is obtained at too great a cost to be so needlessly destroyed.

Phosphorus and Sulphur.

The use of phosphorus in many cases has given an increase in growth of legumes and this from evidence on hand at the present time is the only reason for its use in the orchards of Western Oregon. Conclusive evidence is at hand to show that the benefit derived from the use of phosphorus in certain sections has been entirely due to the sulphur present in that fertilizer.

In summing up then it would seem that the introduction of leguminous crops to supply humus and nitrogen, the use of nitrate of soda and the by-products of meat packing plants for nitrogen are the sources to which the orchardist must turn in his attempt to establish permanent soil fertility. The question is then which is the cheapest form of nitrogen.

From a permanent soil standpoint, the needs of the orchards are, first and most important; make the home for your tree the best possible under the circumstances, and second; supply nitrogen in some form, as it is the element which is necessary to produce that balance in your tree which leads to vigor and fruitfulness.

Mr. Allen: In these days of Hooverizing and conservation and everything else, this fertilizing question is getting to be a big one. We have had an experiment in Southern Oregon and we find that the great waste is being made by using fertilizers just simply because we need something. No one should apply any fertilizer without going first to some expert and finding out what he needs. I found one man who was going to apply lime to his land and upon investigation, I found he had 375,000 pounds to the first acre foot. In some instances they get results from land plaster, but when they used it it was due to the fact that lime was not available.

We are paying enormous prices for sulphur. You have special conditions here, as we do in our part of the country. People buy fertilizer by tons. How do they know what they need? You have to take your soil and add what is needed. If this is done there will be enough fertilizer for all.

Mr. Miller: I think people are making a mistake. I had some land on which I tried some experiments. I tried various things and found I had wonderful results from nitrogen, so instead of buying nitrogen, I planted vetch and the results show that all that soil needed was nitrogen. He is absolutely right when he says that we should use what we have and can produce instead of buying commercial fertilizer. I had an orchard of six acres. It was a good opportunity for an experiment. We cut out the old wood, sowing vetch each year. Last year that orchard produced 3000 pounds dried prunes to the acre. The nitrogen is the thing which revives the old orchard. Try out your own piece of land.

Mr. Minton: Mr. Brown, in an orchard where the ground indicates plenty of nitrogen, and lacks humus, what would you use for green manure?

Mr. Brown: Oats might be grown with the vetch.

Mr. Minton: What time would you plant it?

Mr. Brown: Sow in September, or even as early as August. Peas have not given the result that vetch has. They are more of a summer crop. Growing of some crop like peas which adds some fibre to the crop would be very desirable. Crimson clover is good in Hood River Valley, but not here.

Mr. Miller: I succeed by growing fern in the orchard. It is the best crop I have had. It brings good results. Where I get the best fruit is where I have the tallest fern. Fern roots go down eight feet. If the roots reach down deep they make a reservoir for the water. Where I lived before there was a type of wild grass and I cultivated it and plowed it under and when I came down here the fern was so prevalent, I cultivated that. If you possibly can, let your fern grow and turn it under.

Mr. Macrum: I am very glad to hear from Mr. Brown. Vetch raising in an orchard where there are red apples is not profitable. I have seen orchards where they have heavy crops of clover or vetch and they have no color in their apples. That, of course, does not apply to prunes or green apples. I, too, have a fern patch and am harboring it. That fern is worth a lot.

Mr. Stolz: There is just one thing. The old prune growers say if you want to avoid being affected by frost in the blossoms, you want your ground plowed. If a green crop is to be plowed under before the blooms come out, how are you going to meet the two conditions? I wonder if one crop of clover is not worth two or three crops of vetch. At least that has been my experience.

Mr. Brown: I think that is very good. There is difficulty in getting the red clover started in some places. It would be worth two or three crops of vetch. The other question regarding plowing affecting the bloom, I don't think we have any figures regarding that. The best efforts obtained from vetch is that plowing can be extended until later in the spring.

Mr. Minton: You say the value of the vetch is in the nitrogen gathered in the roots. At what time in the life of the vetch do the roots begin to gather the nitrogen?

Mr. Miller: I don't know that there is a very heavy growth in the roots of vetch in the winter time. My understanding was that the value came without letting it get into the bloom.

Mr. Minton: When do the globules form? Before or after blossom?

Mr. Franklin: I had some heavy clay soil in a loganberry patch and I sowed 14 rows of vetch and plowed it under in May. The roots were filled with globules but the vetch was not in bloom. When I plowed it up the ground was filled with globules.

President: We will call our meeting at 1 o'clock and adjourn at 3 in order to take the out of town people for a drive out into the country.

Mr. Miller: I heard a number of people say that they would like to visit the Wittenberg-King plant, and believe it would be a good plan to make a visit there.

Mr. Minton: The Loju plant has sent an invitation to visit them in a body at any time it is convenient for us. They want to show us through the plant.

President: We can visit Wittenberg-King when we return from our drive this afternoon.

Mr. Park: Let us decide on a time to go to the Loju plant.

President: I believe 1 o'clock tomorrow would be a desirable time for that.

Meeting adjourned to meet at 1 o'clock in the afternoon.

Meeting called to order at 1 p. m.

President: We will now listen to an address by Prof. McKay on "Potato Diseases and Remedies."

POTATO DISEASES AND REMEDIES

By Prof. M. B. McKay, Oregon Agricultural College

There probably never was a time in history when it has become so necessary that we not only conserve food but that we should give close attention to all those factors which enter into a greater production of food materials with the same amount of labor being expended as at present. The potato, as we all know, has become of especial importance on account of its great value as a partial substitute for more concentrated foods, such as wheat.

There are at present in Oregon six serious diseases of the potato and a score more of less important ones. The severe losses that growers often suffer from are due in great measure to too continuous culture of potatoes on the same land and to a lack of knowledge of the nature of the diseases. In a general survey made of many Oregon potato fields it was found that from a few to 85 per cent of the plants in different fields were attacked by disease resulting in a great reduction in yields.

General Control Measures.—In all adequate plant disease control it is to be remembered that prevention and not cure is the great factor of importance. In disease prevention there are five factors that must be considered; namely, rotation, seed selection, seed disinfection, spraying and storage conditions.

1. Rotation.—A number of the organisms that attack the potato live over the winter in the old tops or other refuse left in the soil after harvest and these offer a source for the renewal of the disease the following year if potatoes are again planted on the same ground. Other organisms are found in the soil from year to year and only seem to lose their virulency when not able to attack the same host year after year. Where rotation is not practiced, there can only be one outcome, and this is a well established fact; namely, that the diseases gradually increase in amount and severity until finally profitable yields can no longer be secured and large areas have to be abandoned for potato culture. It is known that some organisms remain alive in the soil for three years even though no potatoes are grown on the land during that time. Consequently it becomes necessary to practice longer rotation in order that the organisms may die out of the soil. It, therefore, is advisable to grow potatoes on the same land only once in four or five years, the ground in the meantime being planted to other crops which are not affected by the potato parasites. The question is sometimes asked, can we safely plant beans and tomatoes in the rotation with potatoes? It is not advisable to immediately follow potatoes with either of these crops since the Rhizoctonia which attacks the potato also may cause severe damage to either beans or tomatoes. However, if potatoes are followed by some cereal, then beans and finally clover, the rotation should be a safe one to follow for disease control.

Therefore as one of the factors in the prevention of disease, rotation must be considered of fundamental importance not only in relation to potatoes but also to the other crops that are to be in the rotation series with them.

2. Seed Selection.—There are several very practical reasons why seed should be selected if the greatest efficiency in potato culture is to be attained. Tubers which are uniform, smooth, free from all diseases and weighing on the average from three to five ounces will when planted not only increase the subsequent yield therefrom but also give greater uniformity in the size and shape of the resultant tubers together with a greater freedom from disease. The only extra labor involved to produce these better and cleaner yields is that concerned with the initial selection.

The best time to select seed is either during the growing season or before the tops are dead so that it can be determined that the plants are free from wilt or other diseases (see Extension Bulletin 186) and that the tubers are uniform in color and shape and true to variety. The tubers from such hills can then be used for the general seed the following year. As a result of this careful selection the entire crop should be in a condition to command a higher price and also to start a reputation for the grower that may become only more secure as the succeeding harvests show the same care in their products. At the present time in Oregon the potatoes grown in such fields which have met the requirements of the Potato Certification Board are bringing a higher price and a much quicker sale than the general run of commercial potatoes.

3. Seed Disinfection.—Before the selected seed or in fact any other seed is planted on the rotated land it should be treated with a disinfection solution. Before treating, it is best to run the potato tubers over a slat work sorting table or rack and discard all that are cracked, bruised or show even slight decay. This will also remove much of the dirt which might otherwise rather seriously interfere with the disinfecting solution. Although both formaldehyde and mercuric chloride are in general use for treating potatoes, the mercuric chloride solution is the one to be preferred for Oregon, for it controls other troubles as well as the formaldehyde does and in addition the Rhizoctonia disease which is so very prevalent, and our worst disease.

Formula for Mercuric Chloride Treatment.—Mercuric chloride, four ounces; water, 30 gallons. Soak the potatoes in this solution from one and one-half to two hours and dry before planting.

The proper amount of mercuric chloride should be carefully weighed out and dissolved in a small quantity of hot water in a wooden or porcelain container. When dissolved the solution may be diluted to the required amount, care being taken to always use proper containers. Metal vessels should never be used. It should always be borne in mind that this solution is very poisonous and potatoes which have been treated should never be used for human consumption or for feeding to animals.

The disinfecting solution should be made up fresh and should not be used more than four times. Thirty gallons used four times will treat about 12 bushels in sacks where a large tank is used as container. After treatment the potatoes should be dried throughly and should not be placed back in the same bags or storage places unless they too are disinfected. (See "Storage Conditions.")

Until there is more experimental evidence at hand to prove otherwise, it seems to be the safer and better practice always to treat the potatoes before cutting and not after they are cut, as occasionally the seed pieces are considerably injured by the solution coming in direct contact with the cut surface. In cutting potatoes, it is advisable to have for each cutter two or three knives, which, when not in use, are to be kept with their blades immersed in a strong solution of formaldehyde. When cutting, reject every tuber which shows any signs of disease or discolorataion of the interior, especially near the stem end. Drop the knife used in cutting the discolored tuber into the formaldehyde at once to prevent infecting other seed with it and take out one of the knives to use until another suspicious potato is cut.

Spraying.—In certain sections of the state, as along the coast and where late blight is prevalent, spraying must be commenced early in the season when the plants are six to eight inches high and repeated at intervals of two weeks or as weather conditions require. Bordeaux mixture of the strength of 5-5-50 is usually used and should be applied by a spray machine which furnishes three nozzles to the row and which will maintain at least 100 pounds of pressure. For more detailed information, consult Bulletin No. 186 of the O. A. C. Extension Service.

Storage Conditions.—Even after potatoes have been selected, treated and grown on rotated land they should not be carelessly abandoned to any type of storage whatever, as is too frequently found to be the case here in the state. The finest of potatoes will not keep well in poor storage.

A good storage place embodies the following requirements: ease and thoroughness of ventilation, ability to prevent rapid change in inside temperature in response to rapid changes in the temperature of the atmosphere outside, convenience in cleaning, conveniently arranged for use, ample in size, and durable.

A type of storage place used with much satisfaction in this state is the double-walled, sawdust-lined bin with a false floor at least six inches from the ground or the main floor. The walls are six inches thick and have ventilators on the side, which, when the days are warm, may be left open at night and kept closed in the daytime, with the result that the whole bin is kept reasonably cool all the time. No bin unit should be larger than about 10 by 10 feet and there should be a double-slatted wall separating them so that air may circulate entirely around the pile of potatoes. When potatoes are piled in the bins loose they should not be piled deeper than six feet.

The temperatures are apt to be higher during the first two months of storage and more injury is apt to result then than later. Consequently more care needs to be given then than at any other time.

All storage places should be provided with a theromometer so that the temperature may be regulated intelligently. They should also be thoroughly cleaned and disinfected before potatoes are again placed in storage in order to kill all the potato rot producing organisms already present. To accomplish this, the storage places may be swabbed or sprayed until wet with either of the following solutions: One pound copper sulfate (Bluestone) and ten gallons water; or one pint formaldehyde and ten gallons water. After being disinfected the storage places should be well aired and dried out before potatoes are again placed in it.

As to the specific diseases which attack the potato plant and which it is well to become familiar with, I would refer you to Bulletin 186 of the Agricultural College Extension Service. If you do not already have this bulletin, it will be sent you on request. If you find that any of your questions are not answered in this bulletin, write us and we will gladly serve you if we can.

President: As it is rather late and we desire to take the outside men for a ride it is in order to adjourn.

Mr. Park: I make the motion that we adjourn to meet at 7:30 this evening. Motion seconded and carried.

The Salem Commercial Club had provided automomiles and the visitors were taken out over the prune districts and shown the orchards and the matchless scenery with which they are surrounded. Upon returning they were then taken to the Wittenberg-King evaporating plant and shown their process of dehydration of fruits and vegetables.

Meeting called to order at 8 o'clock p. m., being an adjourned meeting from the afternoon.

President: The first thing on the program is an article by Mr. F. A. Frazier, of Oakland, California. In the absence of Mr. Frazier, Mr. Minton will read the article.

Mr. Minton: Last year Mr. Frazier gave us a very interesting paper on dust spraying.

FURTHER OBSERVATIONS ON DUST SPRAYING

By F. A. Frazier, Oakland, California

At your last annual meeting it was my privilege to bring to you a message from the East bearing upon the splendid work done in New York State by the Experiment Station of Cornell University, which work was a practical orchard demonstration extending through four years, and followed by the adoption of the method by many of the leading fruit growers of several eastern states and observed by the Cornell investigators.

While at that time the new method was being accepted by the leading fruit growers of the east as a success fully demonstrated, it yet remained to prove its applicability to our western conditions. Or rather it was a case of "showing the Missourians" of the West that the new system was for them also.

The season's work on the Pacific Coast has, on the whole, been very satisfactory. In Oregon the fungus was not bad enough to put the dusting method to a severe test; but, opportunity was given to demonstrate the rapid and enonomical application and thorough distribution together with the splendid sticking qualities of such materials as the superfine dusting sulphur, arsenate of lead in powder form and tobacco dust.

This has been a bad season for codling moth and many growers suffered loss because of not having the poison on the trees at the right time. This occurred to those liquid spraying and to those dusting as well. A fair comparison does credit to the dusting method, and especially when considering the fact that those dusting were novices in the work as against those with long experience in liquid spraying.

In California remarkable results have been accomplished with the improved dusting system. especially in the control of the walnut aphis by the use of a mixture containing tobacco dust.

It is apparent to any observer that the possibilities for use of this system are unlimited. The labor saving, time saving elements alone should bring dusting to the front in times when labor is an increasing problem, and under conditions ever likely to arise when the time element is all important. With the use of up to date dusting machines and with the greater skill that comes from experience, and with care to use none but the finest materials, this system can be depended upon to give satisfactory results and at a substantial saving in expense.

The dusting system is by no means confined to orchard use. It is available for field and garden crops. Splendid results are being obtained in controlling cabbage aphis and cabbage worm, and also the insect which attacks broccoli, this with a combination dusting powder made up of arsenate of lead, tobacco dust and sulphur. In California the red spider mite is very serious at times on nut and fruit trees and on field crops such as beans. This mite is easily controlled by a proper application of a very fine sulphur. We have now perfected a sulphuring machine attachment whereby eight or more rows of beans can be dusted at one trip making possible the sulphuring of thirty to forty acres of beans in one day with one machine.

The dusting method is quite well past the experimental stage. True it may be several years before scientific experimentors determine the exact basis of comparison with the usual liquid method, but for all practical purposes the up to date orchardist will find the dusting machine a valuable adjunct to his equipment, and the more he uses it the more he will appreciate its advantages.

A word of caution on one important point: Every grower here knows how for years we labored for better and more thorough spraying. High pressure pumps and extreme thoroughness in application of the best materials obtainable was always a leading topic at all fruit growers meetings—and properly so. It is no less important to have the right kind of a dust blower, to use it right so as to obtain a thorough distribution of materials, and, to have materials of proven value. On the heels of success with this system there is sure to come those who will offer something "just as good" in dusting materials. Better be guided by those who have made a success of the system and who are in a position to know why dusting failed in the past and why it is now a success. The sulphur or the arsenate of lead or the tobacco dust that is offered as "pretty nearly" as good as that used last year may be just near enough to spell failure. This system has too much good it in for every grower who finds a need for quicker application of insecticides and fungicides together with the labor saving feature to have it spoiled in an effort to save a dime on the cost of materials. There are several brands of good arsenate of lead powder—be sure that the brand you use is right.

That which was known as tobacco dust a few years ago will not do. Commercial ground sulphur is altogether impossible. Sublimed flowers of sulphur will not do. Use only sulphur specially prepared for dusting purposes. Fineness is all important.

President: In the absence of Mr. Frazier, of course, there will be no opportunity to ask any questions and have any discussion.

Mr. Park: Does any one here know anything about the dusting process?

Mr. Zinser: I am not a member of the Association. We have been carrying out some experiments this year at the Oregon State Hospital and Mr. Frazier kindly loaned us a machine. We have results that check on both liquid and dust. This is only one year of experiment so far, and as far as controlling other diseases than worms, such as mildew, we cannot say whether this has been a success or not. We hope to carry this further next year and hope to have more definite data. It surely is a time saver because one machine and a driver and a man at the nozzle can cover a great deal more territory than you can with a liquid macihne, two sprayers and a driver. The cost of material is somewhat greater. I believe I am right that the cost of material for one acre is $3.09 for dust and $1.15 for liquid material. That includes approximate labor. Although the cost is somewhat greater with the dust, it is a great labor saver and next year we hope to cut down the expense of material.

Mr. Park: What per cent of worms did you have in your two checks, liquid and dust?

Mr. Zinser: We had no check on that.

Mr. Minton: How near did you control the worms by either method?

Mr. Zinser: This year was a very bad one for worms and we had a great many. But we controlled it to a per cent where we believe it was a check on both liquid and dust, and found that dust is practically as good as liquid.

Mr. Witherspoon: You said practically as good. Does that mean as good?

Mr. Zinser: I believe it is equally as good. The dust penetrates all parts of the tree, and if you allow a definite amount of time it will settle.

Mr. Witherspoon: Would it become a paste when reached by rain?

Mr. Zinser: You can see the effects of dust on the trees some time after rain. It shows on the trees nearly as much as liquid. In some cases it doesn't show as much as you think it would, but by using a microscope, you can see the dust on the leaves.

President: As there are no further questions we will proceed with the next paper, which will be on the "Evaporation of Fruits and Vegetables," by Mr. Stanley Armstrong, Wittenberg-King Co.

EVAPORATION OF FRUITS AND VEGETABLES

By Stanley Armstrong, Wittenberg-King Co.

The evaporation of fruits and vegetables is the simple process of removing the moisture from the fruit or vegetable by the application of heat, in such a way that the cells are not broken down, or in any way impair the food value of the product, leaving it as the original, when it has been refreshed.

Evaporation is as old as the history of fruits and vegetables themselves, however, improvements have been affected of late years to such an extent that fresh fruits and vegetables may be put in a state of conservation and brought back to the original state at any time of the year that the consumer wishes to avail himself of their use.

Evaporation is one of the methods of food conservation that has enabled man to live in barren countries, to undertake long and perilous expeditions and be insured against the dread disease of scurvey. It has been the means of interchange of food between far and distant countries and basing our judgment on present day exports, the magnitude of this interchange which will undoubtedly develop in the next few years, will be surprising to the most optimistic student of evaporation.

Well conducted evaporators offer a stable market for the producer. What the Northwest needs is a market for its product. A market for products varies directly with consumption within a radius which is profitable to ship. The Willamette Valley is a wonderful territory for the production of all kinds of vegetables, but generally speaking all that is produced is the amount which can be consumed locally. We cannot ship our cabbage or our turnips to the more congested districts as New York and Philadelphia, and compete against the eastern green products of the same variety. All of our staple vegetables such as potatoes, onions, rutabagas, turnips, string beans, celery, spinach, and even our fruits are limited to a great extent beyond possibilities of consumption in our own locality.

This great Northwest is not favored with a population sufficient to consume but 1-100 of 1 per cent of vegetables that can be raised here, therefore, our fruits and vegetables should go out into the world's market in such a way they will compete with other products of the same kind raised in any other localities, and this can be brought about and profitably executed by putting the products through a form of evaporation, a method of food conservation which will eleminate the heavier and more costly containers and the cost of transporting an enormous amount of water which is contained in the fresh vegetables and fresh fruit, and by virtue of these facts vegetables from thousands of acres of undeveloped territory in the Northwest, a district which can produce the finest vegetables in the world, can be spread broadcast over the world through the medium of up-to-date evaporation and systematic sale campaign.

Let me call your attention to the fact that the duty on commodities placed in foreign countries, is based on weight. The average shrinkage of vegetables will run about twelve pounds of green product to one pound of the evaporated. After the process of evaporation the moisture is removed to such an extent that the decaying bacteria has no medium in which to work, and cause decay to the finished product. Thus, we are enabled to place fruits and vegetables in the South American markets, an article which will keep almost indefinitely, and is 95 per cent cheaper on duty rates than the fresh product placed there by any other means of preservation. This peculiar adaptation to foreign shipping requirements is invaluable in our present work of assisting the allies with food supplies. It is to be regretted that the reason for existence of so many local evaporating concerns is the necessity of finding markets for the vicinity. The business of this type is just beginning its difficulties and some factors will have to be overcome, but when these manufacturers are enabled to take your vegetables and fruits and meet the market demands in the world's markets at a profit to the farmers, regardless of the length of shipment, then are the farmers insured of a steady and unfailing market. They are relieved of the liabilities of shipping, and fluctuating prices, and can enjoy an average fixed profit for a certain period of years. Regardless of the method of evaporation used the finished product can never be superior to the products used, and it is of paramount importance that evaporators be furnished with such fruits and vegetables as are fit for table use. Tough and dried vegetables cannot be made into appetizing evaporated products, nor can insipid, dry, or under-ripe fruits be processed so that they will be a welcome addition to the table. One of the causes for the lack of popularity of the so-called dried product in the past has been the lack of discrimination in the purchase of the produce to be dried.

To get products delivered to the evaporator in a satisfactory way, there are many factors to be considered from many angles. Certain varieties of products have proven to be better for processing than other varieties of the same product, and thy must be delivered in a prime condition. The assembling of large tonnages of the proper vegetables and fruits throughout the country and proper handling through our shipping facilities, proper handling and storing at the plant, are all important factors which go to successfully turn out an A No. 1 product. In accomplishing a satisfatory delivery, these institutions need the co-operation of the farmers. It is not an uncommon thing for a grower to ship a carload of carrots or some kind of vegetable, bill out the car, and put the bill of lading in his pocket, giving no information from which we could learn from whence this shipment came. Also, it is quite common for two or three growers to get together, ship a carload of products, each adding a specified tonnage to the car, but neither marking his individual shipments or giving us any information at the plant as to the tonnage of each person. I could name many of these irregularities which ultimately cause great dissatisfaction with the grower, and as grower and members of the institution must co-operate fully, it is my opinion that to successfully market large tonnages of vegetables through evaporators or canneries that marketing associations among the farmers within a zone of a certain radius should be formed, a shipping point and warehouse facilities established, a manager in charge of the organization to receive, account for, and ship out all products within that zone. Contracts can be had from the evaporators for large tonnages of these vegetables within these zones. A system of this kind can be worked out to satisfaction of the grower and the institutions.

On the following fruits and vegetables the varieties and specifications for evaporation have thus far proven to be as follows:

Apples—All winter varieties—those larger than 2¼ inches and not badly misshapen.

Apricots—Moorepark, Blenheim; being firm ripe.

Cherries—Bings and Lamberts in the order named; must be in the same condition as for marketing.

Loganberries—Red ripe.

Pears—Bartlett; free from worms and larger than 2¼ inches.

Peaches—Elbertas, Muirs, Salways and Fosters; above 2¼ inches in size and firm ripe.

Prunes—Italian; free from brown rot.

Raspberries, Strawberries—Firm ripe as for marketable conditions.

Beets—From 1¼ inches to 4 inches in size.

Beans—Green Pod Stringless; same condition as used for table.

Cabbage—Danish Roundhead or Danish Ballhead; must be firm.

Carrots—Chantenay; must be firm and tender.

Celery—White Plume or Golden Self Blanching; must be of marketable size and quality, sprouts and hollow stocks excluded.

Potatoes—Any of the standard varieties; must be free of any disease effecting the meat of the potato.

Pumpkin—Little Luxury; must be ripe.

Squash—Boston Yellow Marrow.

Spinach—Any of the marketable varieties such as Thick Leaf, Victoria Long Stem, etc.

Turnips—Orange Jelly, Purple Top Globe, White Egg; they must be firm and free of worm tunnels.

It is absolutely necessary that the grower furnish to the evaporators a prime fruit and vegetable, and it is absolutely necessary for the evaporators to pay Mr. Grower a price which will give him a legitimate profit on his business. I cannot emphasize too much the importance of the grower delivering prime fruits and vegetables. Too often he is apt to think the evaporator is a by-product factory and that anything goes.

The apple is practically the only product in which the cull grade is used. In this regard the evaporator is doing its share to help commercialize the great orchards of the Northwest. Three years ago cull apples in the Hood River district could be purchased from $5.00 to $7.00 per ton. This year the price ranged from $10.00 to $15.00. The Yakima Valley produced in the neighborhood of 8000 cars of apples. The estimate for culls was about 8 per cent of the crop. A year ago many thousands of tons of these culls were absolutely wasted, owing to the lack of market. This year it is estimated that not over 5 per cent of all culls were left unmarketed. The evaporator manufactures the rings from those culls which do not have worm tunnels. Those having worm tunnels are pared, cored, split in half and the worm tunnel removed. They are then cut into cubes which find a ready sale in all markets. The very poor grade of culls are either sent to the cider factories, or chopped up, dried, and sold to jelly factories as a base for pectin. Peelings and cores are marketed in some way, so it is seen that in comparatively few years in the history of the Northwest apple industry every grade of apple from the poorest cull to the extra fancy has found a ready market, and I wish to emphasize, at a profitable price.

What the evaporator has done for the apple industry in the past few years just that much will they do for the other fruits and the vegetable industry.

President: That is a very good paper and I am glad Mr. Armstrong consented to give us a paper along that line. A great many growers used to ship mixed cars of prunes. A half dozen men would ship a car and not mark their sacks and we would have to let the car stand anl pay demurrage until we could find out the names of the shippers.

Mr. Miller: Mr. Armstrong, have you ever evaporated any variety but the Bartlett pear?

Mr. Armstrong: The Anjou pear could be evaporated.

Mr. Miller: What about the Bosc pear?

Mr. Armstrong: There is no question about the evaporation of any variety but it is simply the high cost of evaporation that has to be taken into consideration.

Mr. Miller: They count the Bosc as one of the best of Willamette Valley pears. There should be some method taken to take care of these pears.

Mr. Armstrong: There will be no question about taking care of them if they prove to be a good evaporating pear, they will be put on the list.

President: Wittenberg-King have done so much pioneering in other ways that they have not done investigating in pears, but have followed the line of least resistance.

Mr. Macrum: The Bosc has not been used in evaporating because it is not well known. I believe the Bosc will make the best pear, because it contains much sugar content. It has a distinctive flavor.

President: Usually in a small quantity of goods there have not been enough experiments made to know whether they are marketable or not, and the manufacturer looks for a large supply. With the Bosc, there have not been enough to develop the business.

President: Mr. Minton, have you any invitations you want to present?

Mr. Minton: I have an invitation from Roseburg from Mr. Chas. E. Brand asking that the next meeting of this Association be held in Roseburg, also from Corvallis asking that the next meeting be held in Corvallis. Of course, you know you are always welcome to come to Portland. I understand that Dallas was to extend an invitation.

President: They have sent no formal invitation to come to Dallas.

Mr. Minton: We can consider Dallas while considering the others.

Mr. Bailey: On behalf of Roseburg and Douglas County, I want to urge you to come to our city. We will give you a good time and let each one catch a 40-pound salmon. We have broccoli in our country and market from 50 to 500 cars each year. I believe if this organization would come to Roseburg we could put some pep into the people and the organization.

Mr. Witherspoon: On behalf of the people of Eastern Oregon, the country you hardly ever heard of, I extend an invitation on behalf of the citizens of LaGrande. I cannot promise you a salmon, but can promise bright sunshine and guarantee a good time and a live attendance. I believe a great membership could be taken from Umatilla, Malheur and Union Counties.

C. J. Hurd: I was instructed to say from the Commercial Club at Roseburg as well as the Association from Garden Valley that they would show you all the hospitality possible. They are very anxious to have the next meeting there. I am very confident that we deserve it. It is a new fruit community just coming into bearing and we need enthusiasm and while we would all like to go to Eastern Oregon where they have jack-rabbits, we have other inducements to offer in our part of the state.

Mr. Park: I move that we accept the invitation of Roseburg as our next meeting place.

President: Motion seconded and carried that Roseburg be our next meeting place. I would like to say that the Sutherlin peope have joined with Roseburg for next year. They put in a call from Sutherlin last year.

President: The next thing is the election of officers. Motions are in order for President.

Mr. La Follette: I believe we had better keep the present man for President.

President: It has been the custom of the Association to elect the President from the town where we go next year.

Mr. Macrum: Following the custom of electing the President from the town where we will meet next year, I therefore take pleasure in nominating Dr. C. H. Bailey of Roseburg as our next President.

Secretary instructed to cast ballot for Dr. Bailey as President of the Association for the coming year, and motion carried unanimously.

A call was made on Dr. Bailey for a speech.

Mr. Bailey: This is not the time for a speech. Brother Worsley and I are both wound up and I am going to wind Mr. Worsley up a little more and let him make my speech.

President: Nominations are in order for Vice-President.

Mr. Park: I nominate Mr. Worsley as Vice-President.

Secretary instructed to cast ballot and motion carried unanimously.

President: Motions are now in order for Secretary.

Mr. Macrum: I nominate our present Secretary, Mr. Minton, for re-election.

Moved and seconded that the President cast ballot for Mr. Minton as Secretary for the coming year. Carried unanimously.

President: The election of a trustee is in order.

Mr. Miller: Somebody has suggested that it ould be well to put a little more pep into this Association and it seems that we cannot do better that to put Col. Dosch in as trustee. Secretary instructed to cast ballot for Col. Dosch, and motion carried unanimously.

Mr. Minton: Under our by-laws, the annual meeting must be held in Portland and it has been our custom when we have an election, that we adjourn/ the meeting, to meet in Portland to ratify the actions of this session, and I move that when we adjourn we adjourn to meet Monday, December 10th, in the office of the Secretary, 702 Spalding Building, Portland, Oregon.

Motion seconded, and carried.

Mr. Bailey: I made the remark that we wanted to put a little pep into this Association. Mr. Hurd and I spent an hour trying to find a report of this meeting in the Oregon Journal. In the Oregonian we found an 8-inch item on an inside page. It seems to me that we should appoint some member of this organization as publicity man and have him keep in touch with the papers of this state, and in that way we can help to develop the organization. There have not been over 35 or 75 people in attendance at this meeting and there should be 500. I don't think it is the fault of the officers but there is something fundamentally wrong with our organization. I think we ought to make ourselves a committee and find some scheme to get all vegetable and fruit growers to become live members.

Mr. Minton: I want to say to Dr. Bailey that I think every newspaper in the State of Oregcn had a program and to my knowledge Mr. Paulus sent out nearly 1500 personal letters to people surrounding Salem and others directly interested, in the state.

President: I could not find a Portland Journal reporter last night, to give the story to. If Dr. Bailey will be here tomorrow I think he will see this room packed to the doors. The local men from around Salem all come to town Saturdays and don't want to make two trips into town. From what I learned from the growers they will all come tomorrow.

Mr. Bailey: It has been suggested that Mr. Miller would make a fine publicity man for this section.

Mr. Miller: I want to say that Dr. Bailey is a stranger to me. He does not know me. If he were going to select the worst publicity man he would select Mr. Miller. If you want to select a publicity man and I think it is perhaps a wise thing, as the publicity is getting to be a very important factor, I have in mind a man I think is particularly efficient in that line and I would like to suggest him. I remember the early days when the work of this organization was in the hands of some very efficient men and as I remember it the man who was a force was Mr. H. E. Dosch and I would suggest that Mr. Dosch work in conjunction with the Secretary. I know Mr. Dosch has a fund of activity and power to do this work. No man enjoys public work like Mr. Dosch. I am speaking from 30 years of experience and I know whereof I speak.

Mr. Worsley: My friend, Bailey, has made severel references as to what Worsley intended to do at this meeting. I want to say to the members of this Association that I never belonged to any organization in my life but that I believed that Association had an object. If it had no object, it had better disband. I am proud to say that I have been a member of the State Horticultural Society for several years and I believe it is within their power to accomplish great things in this state. They have accomplished much in the past but the opportunity is greater than ever. There are things that we can do. I have heard it stated upon this floor that this organization is the father of the State Board of Horticulture. They are the creating power to get before the people of this state fundamental laws to control and govern the fruit industry of this state, and also the vegetable industry of Oregon. I want to say that I believe this is the time for this Association to make its word heard throughout this state for the simple reason that the State Board of Horticulture is absolutely placed where they are powerless to do anything in this state. In the Oregon legislature last year I heard the Committee on Ways and Means take every dollar from them to carry on the work in this state, an industry that represents 45 to 50 millions of dollars every year and employs 50,000 people. Is there anything for this Associataion to do? I want to tell you to get behind the State Board. I went before the state legislature and labored with them to not take the money away from the State Board of Horticulture. I want to say that this is the time that we want it understood throughout the state that this organization is for the purpose of fostering and bringing forth the interests of this state. We are a child in the state. As I heard my friend Lewis say, "If every available and suitable acre was planted to loganberries it could not supply the demand because we are the home of the berry and there is nothing that compares with the Willamette Valley in the growing of that product. I want to say that there is something for us to do. I say that the time is now at hand when this organization should make itself felt throughout this state and we should go before the next legislature and say that we want not $12,000 but $25,000 placed back with the State Board. It spent $15,000 to keep the moth out of this state. We have much to do. This is not an organization to sit here and listen to papers read. There is more than that for us to do. We want to let the people of Oregon know that we are members of this Association, so that we will become as we should be, the banner state of the United States of America.

Mr. Bailey: That was my speech.

Mr. Witherspoon: As a member of the Board of Horticulture, I am glad to hear the words spoken. I appreciate the way in which this has been put before the State Association. It is a fact that we, the members of the Board, are spending our own money in performance of our duties. Every man is taking money out of his own pockets to keep up the work of the Board of Horticulture.

Mr. LaFollette: I introduced a resolution in legislature two years ago cutting out this 10 hour law regarding fruit industries and it didn't pass at that time and the last session I introduced it again and finally got it through. There weren't any of you there to help put it through. In these meetings you are in too big a hurry. You don't take up any of the new fruits. We are improving the variety of apples a good deal. How many of you ever raised any Delicious apples? I tell you these things ought to be taken up. Then there are new peaches. How many here have raised any Gage Hale peaches? I am learning something all the time. Why don't you discuss the question of whether it is best to spray loganberries, whether it is best to burn them or not? When you have a meeting and it is known you are going to discuss such subjects, you will have a good crowd.

President: This program was prepared for different localities. There are a great many other things we could talk about and we had to leave some of the important things out. For instance we didn't mention walnuts and they are going to be a big crop and the growers will want the benefit of the experience of other people.

President: Do you wish to take any action on Mr. Worseley's suggestion?

Mr. Miller: We need some one representing this Association in the coming legislature.

Mr. Minton: We always appoint a committee for legislature. They will be appointed by the President.

President: I personally spent about a week up at the State House on the cannery bill, but I guess Senator LaFollette doesn't remember that.

President: What other business have we?

Mr. Park: I move that before we adjourn, we appoint a Committee on Legislation.

Mr. Miller: I would like to amend that motion that the President appoint a committee of five with himself as chairman. Motion seconded and carried.

President: I am going to ask Col. Dosch to give us a few reminiscences of the early days of this Association.

Col. Dosch responded with reminiscences of the early days of the Association telling of the start of the State Horticultural Society, also telling of the start of walnut growing in this country.

Mr. Stolz: Sitting here listening to the various talks this idea suggested itself to me. When this Association adjourns it will meet one year from now. It just struck me that if this Association would organize County Societies, who could hold at least quarterly meetings, it would go a long ways toward arousing an interest. I merely throw this out and I believe your by-laws could be so amended to organize County Societies with county officers, subject to the call of the President and Secretary of the State Society.

President: If it is desirable to do this, we can figure on it.

Mr. Stolz: The President and Secretary of the State Societies could preside at those meetings, hold quarterly meetings. These annual conventions are a long ways apart.

President: You have the same thing in mind as the State Grange, and having the President and Secretary presiding at all meetings.

Mr. Park: It would be a matter for the Executive Committee to look into.

On motion meeting adjourned.

SATURDAY, DECEMBER 8, 1917

Meeting called to order at 9:30.

President: Our next topic is "Onion Growing," by J. C. Leedy.

ONION GROWING

By J. C. Leedy, Beaverton, Oregon

The subject "Onion Growing" has been assigned me, but due to its complexity and lack of time I shall take up but a few of its important phases.

Soil and Fertilizers.

The onion will grow upon quite a variety of soils but it thrives best upon a rich mellow soil having an abundance of moisture. For the commercial onion growing in Oregon the beaverdam lands are the only ones given consideration. These lands are located mostly in Washington, Marion and Clackamas counties. This soil forms a type known as cumulose, being composed largely or organic matter and silt with smaller portions of clay and sand.

Beaverdam land is especially rich in organic matter and humus and analyses show large amounts of nitrogen, the greater portion of which is unavailable for plant use. This type of soil generally contains moderate amounts of phosphoric acid and small amounts of potash.

In New York Bulletin No. 265, it is stated that analyses of Yellow Danver onions at that station showed a content of .225 per cent of nitrogen, .086 per cent phosphoric acid and .217 per cent potash. A yield of 300 sacks of 100 pounds each, according to the above analysis, would remove from the soil 67.5 pounds nitrogen, 25.8 pounds phosphoric acid and 65.1 pounds potash. Thus it can be seen that the onion crop uses comparatively large amounts of the three principal fertilizing elements.

Barnyard manure is almost indispensable in the production of onions on any except the beaverdam soils and is used more than any other even on these soils. Indeed there is no fertilizer so well adapted to the production of onions as clean well rotted barnyard manure. It is important that all animal manure used on onion land be well rotted or composted before being applied to the soil in order that the weed seeds may lose their germinating powers and to lessen the danger of fungus diseases. Ten or twelve tons of manure per acre are the usual amounts used being applied in the fall before plowing.

When sufficient manure is not produced on the farm and when it cannot be profitably secured from a nearby city, commercial fertilizers must be resorted to. Indeed commercial fertilizers can profitably supplement stable manure and in some cases be used exclusively with good results, especially on beaverdam soils already rich in organic matter. One great advantage which commercial fertilizers have over stable manure is due to the fact that weeds are reduced to a minimum, thus lessening the cost of production. However, commercial forms have a higher initial cost than the stable manure, tending to offset the disadvantage in weeding.

The Oregon onion growers are becoming aware of the benefits to be derived from the use of commercial fertilizers and are using them very generally, even in addition to stable manure. As the onion is an intensive crop and yields large returns per acre the growers are justified in manuring heavily.

By a series of co-operative tests the Oregon Experiment Station has demonstrated that superphosphate in amounts varying from 400 to 1200 pounds per acre can be profitably used on onion lands in this vicinity, but that the lands vary so much in their fertilizer requirements that it is up to the individual grower to determine for himself the exact needs of his land.

Following this lead I have been conducting tests on my farm for the past two years. The following is my 1917 result:

Fertilizer.	Amount, lbs.	Cost.	Yield per acre, lbs.	Gain over check.	Value of gain.	Net gain.
Check	...	.....	34,560	....	.....	.....
Super phosphate	400	$ 5.00	35,080	1460	$29.20	$24.20
Super phosphate	800	10.00	36,200	2580	51.60	41.60
Super phosphate	1200	15.00	37,520	3900	78.00	63.00
Check	...	.....	32,680	....	.....	.....

Fertilizer at $25.00 per ton; onions at $2 per cwt.

Growing Onion Seed.

More and more Oregon onion growers are taking to raising their own seed as they have found the home grown seed more dependable, although some trouble and expense to grow.

In numerous instances the seed bought in the open market is of poor quality and although sold at a low price per pound is more expensive in the end than good seed costing several times as much.

The first essential for good seed is a supply of well selected mother bulbs of the size, form, color and keeping qualities of the variety best suited to one's conditions. The grower must have an ideal type in mind and adhere strictly to it in making his selection of bulbs for seed if he is to secure the best results. Bulbs from two to three inches in diameter produce the best seeds and should be selected when topping and grading.

A sandy loam soil is well adapted for the production of onion seed. The land is best plowed in the fall, then disked thoroughly in the spring and reduced to a good state of tilth with the harrow and planker.

The rows are marked off by means of a shovel plow, making furrows about six inches deep and three feet apart, into which the bulbs are firmly pressed at intervals of eight inches. About sixty or seventy sacks of medium sized onions are required to plant an acre.

Thorough cultivation should be given during the growing season to kill the weeds and conserve the moisture. As the bulbs are planted in a trench, continued cultivation tends to move the soil toward the plants and aids in keeping the slender stalks in an upright position. Hilling may be resorted to if necessary to accomplish this object.

The seed is ready to gather when it has reached the tough dough stage which is indicated by the yellow color of the head and the bursting of the small seed pods. The heads should be gently removed to prevent shattering of the seed, and then thinly spread in the sun for a few days if the weather permits; if not they should be placed at once in a building having a tight floor or in burlap trays until well cured.

On a small scale the seed is usually threshed with a flail after which it is passed through a fanning mill to remove the light seed and chaff.

Spraying Onions.

Blight or mildew is becoming more prevalent in Oregon onion fields than in former years and it behooves the growers to take steps to combat this destructive disease. In 1916 the mildew was especially destructive, reducing the yield as much as 40 per cent in numerous instances. The growers sent an "S. O. S." to the Agricultural College for help when the rapidly multiplying spores of the fungus began to spread its characteristic purplish color over their onion fields, but due to lack of available funds it was impossible to secure any aid from that source at that time. However the last legislature wisely made provision for experiment work, and in the summer of 1917 some tests were undertaken with the idea of working out methods of control. The downy mildew is closely related to the late blight of potatoes and as bordeaux mixture is the standard remedy for potato blight it was naturally expected to control mildew also.

But the greatest problem was found to be in making the bordeaux adhere to the onion foliage which has a smooth waxy surface. Prof. Barss of O. A. C. who had charge of the work tried out a number of different stickers composed of varying amounts of oils and soaps and found that a 1 per cent solution of distillate oil emulsion gave the best results, considering the sticking and spreading qualities. The damage done by burning the foliage was very slight.

A 30-gallon barrel sprayer mounted on wheels was used in the experiments, being drawn through the onion rows by hand. By using 6-foot hose and 10-foot extension rods on either side of the pump a fair sized strip was covered at each crossing of the field. It was found that nozzles delivering a very fine, misty spray at right angles to the extension rod gave the best results.

As the past summer which was hot and dry was not favorable to the development of mildew, the results of the tests were not conclusive but great hope is held out for the future, since the greatest porblem, that of making the spray adhere, has been solved.

Mr. Minton: As a fertilizer, have you ever uesd sheep guano.

Mr. Leedy: No. I have never tried it. The Diamond Fertilizer Company recommend it, but I have never used it.

Mr. Parks: About what does that superphosphate analyze?

Mr. Leedy: It has no potash. It is a ground phosphate called superphosphate.

Prof. Bouquet: In regard to this question in relation to Salem. Here we have a remarkable area out at Lake Labish. In view of the experience of Mr. Leedy, these Salem people ought to be alive to the proposition of saving money with this fertilizer. There are going to be hundreds of onions raised in the Lake Labish region. If the onion growers would work out this proposition, there's going to be a vast lot of money in it. There should be an association of the onion growers of Lake Labish to get together and get the greatest benefit from the experiments of Mr. Leedy and the experts at O. A. C. Onions are one of the greatest, if not the greatest, truck crop. It is worth more money to the farmer, almost, than any other proposition in this state. One of the most important questions confronting us is fertilization, and the most economic fertilization, and we should benefit from Mr. Leedy's words of suggestion and advice on the raising of cheap-growing onions.

Mr. Stolz: I think we ought to request Mr. Leedy to reduce his statement to an article to be published in the bulletin.

Mr. Minton: This has already been requested.

Owing to the inability of Mr. Lovett to get away, Mr. Barss read his paper, with the consent of the society.

THE WOOLLY APPLE APHIS

(Schizoneura lanigera.)

By A. L. Lovett, Entomologist, Oregon Agricultural Experiment Station

When I first consented to talk before this society on the woolly apple aphis I was at a loss as to how I might present anything new or of value on this old orchard pest. And at the very outset I must confess that I have no definite and sure control recommendation to offer. The woolly apple aphis has been the object of more or less a sporadic study at a number of the experiment stations for a period of years. Preliminary investigations were made at this station in 1911 and 1912 and at that time it appeared that the insect was not a serious apple pest and that our regular spraying practices as adopted for other insects were sufficient as a control to prevent its rapid increase. Later observations show the pest is spreading and its injury increasing. At the present it is considered as a pest, which, while not of first importance, is worthy of serious attention.

Definite projects were outlined for an exhaustive study of this insect in 1916. Due, however, to the loss of assistants and the pressure of other problems the investigation has progressed but slowly. To Mr. Leroy Childs, Entomologist and Plant Pathologist at the Hood River Branch Experiment Station is due the credit for most of the data compiled in 1915-16. Mr. F. H. Lathrop, Assistant Entomologist at O. A. C., is continuing the investigation at the present time.

Life History.—All investigators do not agree on the life history of the woolly aphis and there are certain points which have never been satisfactorily worked out. In the summer, particularly during June and September, the aphis may be found in great abundance on the limbs and bark of the apple trees, collecting in groups particularly about pruning wounds, and on water sprouts. In late summer and fall their numbers decrease, sexual forms sometimes occur and eggs are produced, though always in limited numbers. Many pass the winter as very young aphids collected under the bark scales on the trunk of the tree, migrating to this position during August and succeeding months. Some are supposed to go on down to the roots, but in the opinion of Mr. Childs the number is negligible. In the spring the forms again migrate out over the tree where they settle down to feed and multiply sexually during the summer months. The elm is found to be an alternate host plant of the woolly apple aphis and forms may pass from the elm to the apple and vice versa. One form of the leaf galls on the elm is due to the feeding of this aphis. Apparently, however, because of the continued presence of the woolly apple aphis in regions where elms do not occur, this host is not essential to their development.

The injury consists in large knots, roughened galls and malformations on the body, limbs and roots of the trees, which handicap the normal functioning of the tree and interfere with the growth.

Control.—There appears to be no one satisfactory control measure to adopt for the woolly aphis. For orchards where only an occasional tree is attacked, mark the infected trees for especial treatment. Where the infestation is general, additional sprayings may be necessary.

For a general infestation it is advisable to spray thoroughly and carefully with Black leaf 40 and soap as a 1-6-200 solution (1 pint Black Leaf, 6 pounds soap, 200 gallons water), whenever they occur in numbers sufficient to warrant it. Where the pest is appearing in numbers in the early season it is advisable to add Black Leaf 40 to the 30 days spray. Cut out the infested water sprouts during August and band the main limbs near the crotch with tree tanglefoot to prevent the young nymphs descending to the bole of the tree for the winter.

A treatment for the root forms is reported as very successful by Mr. O E. Bremner, County Horticultural Commissioner of Santa Rosa, California. This consists in the use of tobacco waste in the soil about the base of the tree. He recommends two methods and reported complete success with each. First is a solution consisting of Black Leaf 40, 1-1000, poured about the base of the infested trees, first loosening up the surface soil to permit the solution to reach the aphids on the rootlets. Second is to use tobacco waste at the rate of five pounds to the tree, placed in shallow trenches about the tree.

Summarized then we may conclude that the control practices are yet in an experimental stage. The most promising treatments so far developed are to spray thoroughly and carefully when the pest occurs in numbers. If present in the early season, Black Leaf added to the 30 day spray is of value. Cutting out the water sprouts and banding the main limbs in August and treating the soil with tobacco will do much to clean up an infestation. Concentrated oil emulsion applied to the limbs and trunk with a brush where the aphids occur in bunches is practiced by some growers with beneficial results.

Mr. Worsley: I would like to ask if the horticulturists at O. A. C. have ever made an examination of the cork elms in the yard of the college. Mr. Stewart and I took occasion to go through the college grounds, and there isn't a tree on that college campus that is not the host of woolly aphis. Something ought to be done about these cork elms. There is no use fighting it in our orchards, when the cork elms are in our yards.

Prof. Barss took occasion to state that he was connected with the Department of Botany and Plant Pathology, instead of the Department of Horticulture, and took as his special subject, "The Climate of the Northwest in Relation to Prune Diseases."

THE CLIMATE OF THE NORTHWEST IN RELATION TO PRUNE DISEASES.

By H. P. Barss, Chief of Botany and Plant Pathology, O. A. C.

On account of the important position which the prune industry has assumed in the Pacific Northwest and because of the prospects of even greater development in the future, it seems worth while to consider the conditions which may affect, either for good or ill, the health of the prune tree and the quality and yield of the crop. The last few years have shown strikingly the fact that over and above all local factors, the variations in general climatic conditions have held a predominating influence in the success or failure of our prune orchards either by their direct or by their indirect effects. For several seasons past, we have been furnished with notable examples of extreme variations in both summer and winter conditions. In this paper, I wish to call attention to some of these variable weather conditions and to discuss some of their results on the health of the orchard.

Conditions of disease in trees and fruits may follow from the direct effects of unfavorable environment in its broadest sense or from the attacks of parasites of one sort or another. The attacks of parasites, in turning may be tremendously favored or, on the other hand, almost completely prevented by environmental circumstances. It is certainly of interest to the prune grower to understand the double influence which our variable weather conditions and everything that goes with them may have, not only upon the vigor of the trees and crops, but also upon the intensity of the parasitic attacks to which they are subject. Unless the orchardist has some understanding of these matters, he will hardly be in a position intelligently to adapt his orchard practices either to counteract the unfavorable effect of climatic factors or to ward off the invasion of parasitic fungi when climatic conditions are conducive to their development.

Perhaps the simplest way of bringing out the points I wish to present would be by considering very briefly the peculiar features of climate in the Pacific Northwest which prevailed during the season of 1917, mentioning their effects and bringing to mind also the conditions existing in previous seasons by way of contrast.

Spring Weather.

In the spring of 1917 the opening of the winter buds and the coming of our prune orchards into bloom was delayed for a month or six weeks beyond the usual opening date. This had some bad effects on the health of the trees and also several good ones.

First this delay afforded an additional month or six weeks of most favorable conditions for the prolonged development of a disease which operates actively only during the dormancy of the trees. I refer to the bacterial gummosis canker disease which attained unusual seriousness along the entire Pacific Coast last season, causing great damage in young stone fruit plantings. The destruction was greatest in the cherries but prunes and peaches in some sections suffered to an exceptional extent. This appears to be a distinctly climate-limited trouble. Canker-formation is checked just as soon as trees come into active growth in the spring and the important part a delayed spring may play in addition to the seriousness of a canker epidemic must be apparent to all.

One of the favorable consequences of the late spring was the deferring of bloom till all danger from frost was practically past. Prune growers have feared frost at blossom time perhaps more than any other one thing and have often attributed to supposed frosts the failure to secure an abundant set of fruit when the real cause of failure was to be found in other conditions.

Cold and rainy weather during the whole blooming period such as has been known to occur some years may cause trouble in the entire absence of frosts, not always so much, I am inclined to believe, on account of the effect on insect activity as on the physiological condition of the trees. There is room for important investigations here, but I wish to call attention to certain consequences of too abundant moisture which I am convinced are overlooked by many growers, namley those induced by soaked ground where the lie of the land and the character of the soil make rapid drainage difficult.

Last spring the orchards came out so late as to avoid most of the weather which usually contributes to this sort of difficulty; but, in soils that are heavy or poorly drained, fruit trees of all kinds are apt to suffer, often severely, from a water-logged condition in which the space between the soil particles are completely filled with nearly stationary water to the exclusion of all air. Now the feeding rootlets of trees require oxygen for their healthy activity just as do all other parts of the higher plants. It is true to be sure that in the rain water that penetrates the soil a certain quantity of oxygen is usually dissolved but in saturated soils this is soon absorbed by the rootlets. From then on the root hairs are deprived of oxygen and suffer from asphyxiation, thus losing their absorptive powers or enduring at least partial impairment of function. Soil saturation has but little effect during the winter when the temperatures are low and the trees are inactive but if it continues into warmer spring weather when the trees begin to put forth blossoms and to grow, the condition necessarily becomes serious. At this time the tree makes a sudden demand upon the root system for the water and mineral substances which are required during this period of swift development. If the activity of the root system is impaired from any cause whatsoever, the parts which have begun rapid expansion supported by the supply of sap stored up already within the tree will with the depletion of this source of supply suffer an immediate check. Thus a total inability on the part of the rootlets to absorb if long continued will sometimes be followed by the shrivelling of bloom and tender leaves. Other fruits may be more susceptible to this effect than the prune, but it is probable that too much stale water and too little air in the soil will explain a good deal more injury than many growers are aware of. As one would expect, the effects of soaked soil will show varying degrees of intensity depending on conditions. It can be seen that the abundance of precipitation and the duration of rainy periods will have a most important influence in this connection. In severe instances dieback may eventually occur, while in other cases there may be simply a general retarding effect. Total death of young trees is occasionally reported where unhealthy soil conditions had apparently resulted in actual decay of the root. Ordinarily with the drying out of the soil again a restoration of normal root activity and a return of the tree to a healthy condition may be anticipated.

Attention may be called at this point to the entire possibility that even in the absence, at any time, of visible outward signs, there may be a reduction of vitality in the tree and a tendency to a meager set of fruit or an early dropping of many of the fuits that have begun to develop. No positive statement to this effect can be made for lack of definite experimental data but it would be very unwise to disregard entirely such reasonable possibilities.

Orchard soils are often met with which produce symptoms of root drowning almost every spring. Such soils are usually provided with poor natural drainage and are heavy and cold in character. Tiling will in many cases afford permanent relief and promote a vigorous condition of the trees through its effect on the health of the root system. The use of deep-rooted cover crops which is a much commoner practice than formerly and the plowing under of green manures would also tend to improve the porous character of the soil as well as to add fertility.

Not all effects like those described a moment ago can be attributed to a saturation of the soil in the spring. Other conditions will be referred to later which, though inducing in part similar results, are of an entirely different nature and must be met in a different manner by the orchardist.

Many prune growers report that early plowing and cultivation started before the opening of the buds in the spring has a beneficial effect on the setting of the fruit and the vigor of the tree. This is quite to be expected as the breaking up of the soil early in the season not only provides a favorable condition for the renewed growth of feeding rootlets but it also promotes soil aeration and consequent vigorous root absorption at a time when the first active demand is made on the root system to supply water and mineral substances to the newly developing parts. Experienced growers advise against plowing just as the bloom is coming out. There is a scientific reason for this in that the feeding roots lying near the surface would be disturbed, and their growth and absorption activity interferred with by plowing just when the bloom is depending on the prompt and steady response of the root system to its needs. Earlier stirring of the soil on the other hand permits time for adjustment and the physiological balance in the tree is not upset at the wrong time.

The blossoming period of 1917 was not especially dry and in a few orchards, at least, there was considerable Monilia or brown rot blight of the blossoms. It was particularly bad in cherries but was noticed in some of the prunes. This disease is favored by damp atmosphere, fogs, clouds, rainy weather, etc., especially if such weather continues for several days. Any condition which allows moisture to persist on the tree favors the spore germination and the infection, development and fruiting of the fungus. Spraying has been tried both by the government and by the Oregon Experiment Station, the fungicide being applied just before the blossoms open, and there is an evident decrease in the amount of blight where the work is thoroughly done. In the nature of the case, however, it seems practically impossible to procure anything like complete control under weather conditions which are at all favorable to the disease. A grower cannot stand under his trees and spray daily each new set of buds just as they are ready to open. I feel safe in advising, however, that one spraying of lime-sulphur, about 1 to 25 strength, be given just as the first bloom opens where experience shows that the disease is likely to develop in serious quantities. Many growers testify to a better set of fruit where such spraying is done and some of the experimental work in the Northwest has shown silimar results.

There are other practices, however, beside spraying which will to a certain extent assist in preventing the development of the Monilia disease. All mummies and dead twigs should be removed before spring from the orchard. The stirring of the surface of the ground with a harrow during bloom will help to break off the fruiting bodies of the brown rot fungus which develop from old mummies in the soil. This interferes with an important mode of fungus reproduction which if left undisturbed would result in the discharge of countless numbers of spores into the orchard air as a menace to the opening buds. An open system of pruning which will prevent the formation of a dense canopy of interlaced twigs admits free air circulation into the tree and allows the sunlight to enter the interior. Sun and air are the greatest natural dispellers of most of the fungous diseases we know in the orchard. Breezes and warmth dry off the foliage and leave the spores with no moisture for their germination. Horticulturists also insist that an open tree is the best kind of a tree for fruit production. The prune-grower will find that the right sort of pruning pays from every standpoint.

Summer Weather.

We have considered together some of the relations of spring weather to the health of the prune orchard and will now take up the summer period. While the spring season in the Northwest is as a rule relatively cool and moist, the summers are very variable, but it is an exceptional summer that does not have some very hot and a good deal of very dry weather with frequent winds. Rains, however, are infrequent and the amount of precipitation usually small. Most of the direct effects of the summer weather, then, relate to the intensity of sunlight and the rate of evaporation from the foliage. Of course, there is constant depletion of the soil moisture during this time with little or no return and this must also enter into consideration.

During 1917 a continuous dry spell of almost unprecedented length started with some days of very warm weather in the earliest part of the summer. The foliage which had till then been growing under spring conditions of moist air and consequent low rate of moisture evaporation was suddenly subjected to an exceedingly rapid rate of evaporation resulting from the heat and dryness of the atmosphere. It was fortunate for the prune orchards that this occurred early in the season's growth and that there was at the time abundant moisture in the soil. Had the spring opened up earlier and a greater amount of new foliage been present on the trees at the time of this first hot dry spell, there would probably have been much more serious consequences. As it was the trees had been held back by the delayed spring and a relatively small amount of growth had yet occurred at the onset of the dry period. Thus healthy trees in moist sections met the drouth with very few signs of distress.

Prune trees have an unusually high rate of evaporation from the leaves or as it is scientifically called—transpiration. Prune orchards, therefore, seem to respond more quickly to the ill effects of high temperatures and extremely dry air than do other kinds of orchards. Rather cool, moist atmospheric conditions such as existed almost continuously through more than half the previous summer of 1916 are best for the development of the Italian prune tree as the unusually vigorous condition of the foliage and activity of new growth during that summer testified. The transpiration rate from the leaves was then unusually low, while the evaporation from the soil itself was relatively less than usual. As a consequence the root system was easily able to absorb water from the soil in sufficient quantities to make up for the water loss from the foliage.

In warm dry seasons, however, such as were experienced in 1915 and again in 1917 the prune tree is placed in a precarious condition. Even with an apparently adequate supply of moisture in the soil, the root system often fails to absorb fast enough to make up for the loss of moisture from the leaves. The amount of evaporation from an individual tree will be large when the foliage growth has been luxuriant and smaller when it is less abundant. Because of an earlier spring and greater development of foliage at the time the dry weather came on in 1915 the distress of the trees became apparent much earlier than in the past season which began late. As the soil gradually dries out the symptoms increase in severity. These will be worse in certain types of soils than others and certain spots in an orchard may be worse than the rest. Furthermore, there appears to be a great difference sometimes between individual trees of apparently normal constitution standing side by side in the orchard. This may be due in part to a difference in the root development and absorbing power of the seedlings used for the root system, a possibility which I think has been given too little consideration.

The immediate effects of drouth, whether caused by too little water in the soil, by a diseased or poorly developed root system, or by atmospheric conditions that cause excessive transpiration, are seen in a tendency of the individual leaves to roll up into a sort of tube lengthwise. Terminal growth slows up and may cease prematurely. The foliage takes on a yellowish cast. Eventually there may be in severe cases a certain amount of leaf drop. This leaf roll condition is often accompanied by a poor development of the future. It is thought that other factors, having nothing to do with moisture relations, may bring about or favor the leaf roll condition in the prune and this problem is being taken up as a subject for investigation by Dr. W. M. Atwood, Plant Physiologist in the Department of Botany at the Oregon Experiment Station.

The presence of heart rots and cankers on the trees always interferes with normal water-conduction and induces effects resembling those resulting from drouth. Troubles of this nature are far commoner and much more costly than orchardists think. It is safe to say that in some of our orchards half the trees have internal decay. The time is coming when fruit growers will pay more attention to the immediate disinfection and dressing of wounds and cankers. I might say in passing that Bordeaux paste, which is simply a combination of concentrated bluestone solution with freshly slaked lime and having when made a rather thick consistency, is coming into favor as one of the most effective materials to use for this purpose.

One of the direct effects of climatic variations during the summer may be seen in the peculiar "gum-spot" of the green prune which attracted so much attention about the middle of last summer. The exact cause is as yet unknown. We do know, however, that violent weather changes from hot to cold and from wet to dry or vice versa have tremendous effects on the physiological and growth processes going on in the tree. This is especially true of the balance between evaporation from foliage and absorption from the roots. Cool moist air after a spell of hot drying weather will cause the gorging of the tissues with water and will result in a tendency to increased rate of growth. It is little wonder, then, that sudden changes of this sort are often accompanied by disturbed fruit development.

In the case of the trouble I am calling "gum-spot" for want of a better term it appears that certain small groups of cells in the region of the network of conducting vessels a little distance beneath the skin of the prune, die and at these points gum-formation begins to take place. The liquid gum presses into the spaces between the cells of the flesh and a watery-appearing or translucent spot appears which is visible from the exterior. The gum-pressure usually increases until the skin is ruptured usually in a crescent-shaped split and a drop of gum form on the surface. This condition varies from year to year, from orchard to orchard and from tree to tree but does not appear to cause much real loss though a few growers think that these fruits are apt to drop before ripening. I do not feel sure, however, that this is generally the case. Affected prunes that reach maturity show only a very slight injury and most are entirely suitable for drying.

Persistent dry weather such as was experienced last summer is unfavorable to the development of many important fungous diseases. On the other hand the cool and relatively moist conditions which persisted so late into the summer of 1916 resulted in very serious foliage infection with Cylindrosporium leaf spot in certain prune sections and with Coryneum shot hole in others. These two leaf troubles were difficult to find in 1917 and certainly caused no loss, while the previous summer as a result of their attacks trees were practically defoliated in some orchards long before picking time and serious effects were not only felt by the crop of that year but were measured in the poor growth of the trees and must have resulted in weak buds for the next year. These two prune diseases are favored by moist weather conditions and apparently do not require very warm temperature. The Oregon Agricultural College in 1916 demonstrated that Cylindrosporium could be checked by keeping the foliage covered by a fungicide during the duration of cool, moist weather. The shot-hole Coryneum will probably respond to similar methods.

Brown rot, the most feared of all the prune diseases, appeared in some abundance during the early summer of 1916 and again at picking time but was not nearly as destructive as it has sometimes been. In 1917 it was scarcely in evidence at any time during the season. This disease is favored by moist weather and especially when accompanied by a warm temperature. If the early summer of 1916 had been hot as well as moist a great deal more loss would certainly have been experienced. If weather conditions had been rainy in the early autumn as the fruit was maturing great damage might have been the result. As a matter of fact, taking the Northwest as a whole, the picking season met with such unusually dry weather both in 1916 and 1917 that the brown rot losses were far below the average, amounting this season to practically nothing. The experimental spraying for brown rot control has demonstrated the positive value of spraying in the Northwest, but a study of seasonal conditions has shown that it is impossible to lay down any hard and fast program of application since outbreaks are so closely bound up with weather conditions that cannot be anticipated. My present advice to growers in reference to spraying would be this: Be ready to spray on short notice. Carefully inspect your trees more than once week. When brown rot appears to be getting a start put on a spray at once, knocking down and carrying away the diseased fruit first. The spraying must be thorough and a spreader should be used with the material. Above all, whether any other application is made or not, and whether there is much brown rot or little at the time, one thorough spraying ought to be made three or four weeks before picking. Oregon records show that the average weather at picking time is rainy and all prune men know that rains at harvest mean brown rot. The conditions that have existed the last two autumns are not usual. Growers can use no better means of insuring a crop against the heaviest brown rot losses than by spraying just before the most susceptible period. Perfect control cannot be expected, but our experimental tests have demonstrated a definite and marked reduction of infection in all cases where the pre-harvest spray has been given.

Summer weather conditions appear from the foregoing considerations to exert a most important influence on health of the prune tree. Excessive moisture, excessive drouth and sudden changes in the environment all have their unfavorable effects. To counteract drouth the grower must utilize every resource at his command to maintain an abundant and even supply of moisture and a well-developed root system by thorough cultivation, and in many orchards I am convinced that a most carefully administered artificial irrigation will be required if maximum health and productiveness are to be attained. To counteract excessive moisture and the diseases favored by it, spraying intelligently applied is the only resort.

Autumn Weather.

I have encroached somewhat upon the discussion of autumn weather in the preceeding paragraphs in speaking of brown rot at harvest; but there are a few other very important effects dependent on weather conditions at the close of the season which must not be overlooked. First the condition of the tree as a whole frequently suffers, as summer ends, from insufficient water. The foliage shows it in color and often in premature leaf fall as has been suggested. The fruit suffers from a retarded growth and from other troubles while shoot development may cease too soon. In severe drouth the soil moisture may become so depleted in the upper layers that the feeding rootlets which come nearest to the surface may actually wither and die.

The effects of this destruction of a portion of the root system do not become immediately apparent, for the loss of function by the affected roots occurred very gradually and no sudden change in the tree could follow their death. Not until the following spring, when the expanding buds make a sudden and active demand upon the absorbing powers of the root system, does the partial root destruction make its presence evident by the inability of the tree to make a normal start.

The first growth is retarded. The bloom may wither. The branches may die back. The results must be almost the same as those coming from loss of absorbing power from root asphyxiation in wet soils.

Dry weather retards fruit development and there is good scientific evidence to warrant the belief that during periods of high foliar transpiration the leaves may actually rob the fruit of moisture. The natural result is shrivelling. It is probable that sudden changes of weather from moist to dry or from dry to moist will have more serious effects upon the fruit than continued drouth. The internal browning of the flesh around the pit, quite common in 1916 and very destructive in previous years, is probably caused by weather fluctuations at a critical period of fruit growth, if my surmise is correct. Due very likely to the uncommonly uniform weather conditions of last summer there was surprisingly little of this trouble in 1917. In fact, except for the rather minor "gum-spot" effect, the fruit approached maturity in fairly good shape. After the first little rainy spell in September, however, during the dry weather which followed, there was noticed a marked shrivelling at the stem end of the fruit on a large percentage of the prunes in a great many orchards. In most cases there was no accompanying discoloration of the flesh although exceptions were noted by some growers, so that, although the fruit was not of the best quality, the shrivelling caused little actual loss.

Just what the exact effects of the weather during the close of the growing season may be upon the formation of healthy fruit buds for the next year and upon the storage of nourishment, has not, I think, been investigated for the prune; but it is self-evident that where extensive defoliation has occurred due either to fungous attacks or drouth, thus depriving the tree of a large proportion of its food-making organs, bud development and food storage cannot proceed as it would in a healthy tree and the results will naturally extend into the following season, an important fact which is often overlooked.

One of the most serious effects which may be attributed to autumn weather is the renewal of growth with the advent of continued mild and moist fall weather after a practical cessation of growth previously as a result of dry summer conditions.

Young trees are more apt to make a new start than old bearing trees, but the consequences are bad in any case. Such a condition was very noticeable in the fall of 1915 and resulted in trees entering the winter with the newly formed tissues in an unhardened or immature condition. This may also follow where there has been an abundant supply of soil moisture throughout the growing season and where cultivation or irrigation if practiced is not stopped soon enough. This immaturity renders the trees subject to winter injury of the severest sort if the proper climatic conditions to produce it arise later.

Before passing on I wish to urge the advisability of removing as far as possible from the orchard the fallen fruit which is attacked by brown rot. Such fruit, if allowed to remain, mummifies and a year and a half later gives rise to the fruiting bodies previously mentioned which constitute one of the chief sources of spring infection of the blossoms and young fruit which enable the disease to become well established early in the season. One of the methods which growers have proposed is that of running hogs in the orchard to convert this decayed fruit into bacon.

Winter Weather.

We may now ask the question as to what is the relation of winter weather to the health of the prune orchard. At this time the trees are dormant, the leaves are gone, the roots inactive and a wide range of weather conditions may prevail with little or no effect on the trees; but the winter season can by no means be wholly disregarded.

There are canker diseases which develop at this season. Not very much is known about them, but, judging by what little we do know, long-continued periods of low temperature are unfavorable for their growth while periods of mild weather are favorable for their active development. This seems to be true of the bacterial gummosis on cherry and doubtless holds for the same disease on prune. Mild winters also favor the activity of the insects which are thought to be the principal disseminators of this disease. The nature of this trouble unfortunately renders it one of the most difficult of all diseases to detect while it is working or to combat at any time. In fact, no satisfactory way of dealing with this trouble on the prune has yet been discovered.

Prune trees like other fruits can stand a very low temperature if that temperature is reached gradually. If, however, after a relatively warm day the thermometer drops suddenly to a point way below freezing real winter injury may occur. Then it is that the trees which have gone into the winter without properly hardened and matured tissues suffer the most severely. Such injurious variations in temperature are likely to occur in the very early winter or in the very late winter. The latter case appears to be the more common in our region. There are two ways in which injury may occur; first, from the rapid contration of the bark against the wood which creates a tension severe enough in some cases to cause a splitting of the bark and a separation of the bark from the wood due to the crushing of the softer cells in the cambium region, and, second, from the actual freezing to death of the cells whether accompanied by cracking of the bark or not. In February 1916 there occurred a sudden cold snap which resulted in immense damage to all kinds of fruit trees in the Northwest. Its effects are still to be seen in many orchards. The most conspicuous injury appeared in young orchards not yet in bearing. The weather of the previous autumn had favored late growth after a dry summer and the tissues were not in a condition to resist the effects of the rapid drop in temperature to which they were subjected. The resulting damage cannot be estimated. Prunes suffered fully as much as other fruits. While young trees were damaged greatly, a great deal of harm was also experienced by many older trees which although showing no cracked bark gave evidence of injury by a retarded and abnormal growth when they came out in the spring. In most cases the vitality of the affected trees was not permanently impaired and quick recovery took place accompanied by rapid healing of the wounds. The grower can do little when winter injury of this sort occurs except, where the bark is loosened, to bind it down tightly against the trunk at once in order to prevent the drying out of the wood and to encourage as far as possible a re-uniting of the tissues. Where the bark dies or the wood is exposed, there is grave danger of serious after-effects from the entrance of heart rots. In such cases surgical methods with the use of Bordeaux paste as a protective disinfectant should be put into effect immediately.

It has been a general habit among fruit growers everywhere to lay the blame for most of their troubles somehow on the weather for lack of more precise reasons and I suppose that this will continue. I hope I have made it clear that the growers are absolutely right, by showing some of the actual reasons why weather conditions throughout the year are really responsible directly or indirectly for healthy or diseased conditions in the orchard. A better understanding of the effects of the various types of weather which may be expected in the Pacific Northwest, ought to give a better basis upon which intelligently to plan orchard practices so as to minimize as much as possible the evil consequences of unfavorable weather and to take advantage as far as can be of the benefits of favorable weather. No two seasons are alike and it is self-evident that orhard practice cannot for best results follow any single hard and fast set of rules year after year. It is gratifying to realize that Oregon growers are beginning to appreciate this fact more and more. Our present knowledge of many diseased conditions is very imperfect and our understanding of how to meet them still more so. It is therefore an indication of good judgment when Oregon growers insist that the state make possible the investigation of the more important unsolved problems. How difficult these problems are only the investigator knows. Both investigator and grower find out frequently with some impatience, how long it may take to arrive at results; but only the experimenter knows how often nature herself interferes with a season's plans or in how many instances mischance steps in the way of the investigation. Progress, however, is made only by pushing aside the obstacles one after another and moving ahead step by step. We of the Oregon Agricultural College appreciate the support you have given us in the past and still continue to give us in our efforts to help you solve your problems and meet your difficulties.

Mr. Zercher: It is the general opinion that earlier plowing produces earlier prunes. Is that Prof. Barss' idea?

Mr. Barss: Well, I haven't investigated that question of earlier plowing or cultivation. I think that some of the growers could perhaps give more light on that than I. I have looked at the earlier plowing from the disease standpoint, but not from the question of the early prune.

Mr. Paulus: I think I have heard that said by growers.

Mr. Taylor: I would like to ask in regard to what we call in our vicinity, Scotts Mills, mistletoe in the prune tree.

Mr. Barss: That is probably what we call witches broom of the prune. They are caused by fungi similar to the peach tree leaf curl fungus. In the case of these fungi, they produce large clusters of branches. The way to get rid of those is to cut off the parts that are affected. The reason is that these fungi subsist right in the wood; you can't get at it with a spray and it lives from year to year. On cherries, they don't blossom well, they hardly blossom at all. I have seen a whole tree near Salem which was affected with witches broom and there were about two blooms on the tree.

Mr. Paulus: Doesn't the witches broom sap the vitality?

Mr. Barss: Certainly, as it keeps on growing. You have to lop it off, or it keeps producing these branches.

Question: How much do you cut off? About two or three inches?

Mr. Barss: About a foot or so, just to be safe.

Mr. Minton: I would like to ask about the treatment of the peach bore.

Mr. Barss: The subject of the bore is not my hobby and does not belong to my territory. Prof. Lovett has a series of investigations going now on the best methods of treating that bore. He is not sure yet in his own mind what will be the best method of keeping the bore out.

S. Jones: When does the bore leave the tree? Does he hatch out and fly away?

Mr. Barss: I wouldn't wait until they got out and let them fly away for they come back and lay eggs in your trees again. They form into a moth and lay eggs in that condition.

Mr. Zercher: My impression is that it takes three years for the full development of the bore. The eggs are laid the first year and it grows to about one-third size; the next year, full size; the following year it makes the moth. The moth begin to fly after the warm days come in the spring. The desirable thing is to get them before they begin to fly. It is most difficult to find them in the winter because they haven't begun to throw out their borings.

Mr. Hrubetz: I have watched the borer for twenty years. It all depends on the season. Last year was the most favorable season for the borer. There were two sets of borers matured here last year to my knowledge. I don't remember another year like it. In a good favorable warm summer, a borer doesn't live a year. They mature the same year. If the weather is warm for two months, they will mature but if we have cold weather that holds them back and I have seen summers where they would be held over but that is not common. I think most of the borers will hatch out in one season and this year there were two sets that matured, and in some cases, three sets—those that were held over from the year before matured very early this spring, and it was surprising to see how quickly the others would form a cocoon and mature. Figuring from the egg, there were two sets matured.

Mr. Crouse: My idea of the borer is that they commence their first work about the 15th of June. At that time, the male hatches out and goes to work; and then again the 15th of September, they go to work. According to my observation, the work is done by those that come out about the 15th of June. The best way to get rid of them is to get down on your hands and knees, especially with young trees. If necessary, put on a pair of glasses and take a sharp knife and wire. You will see a very minute sawdust. By taking a knife and scraping you will see the worms. They may be only one-sixteenth of an inch long and from that on up to a quarter or half inch. While they may not do much harm after September, they are hidden under the bark. They will lie there in a dormant condition until spring when they will begin to work down, if they have not already circled the tree. The matter of getting rid of the borer I have heard about for twenty-four years. In California, they offered a premium to anyone who would find out a way of getting rid of the borer without resorting to the knife or the wire, but up to this time there has been nothing discovered that is better than the method of getting down on your hands and knees with a knife and wire.

Mr. Quarnberg: We have held the borers down with complete success by that method. At this time we have no trouble, but more than one must follow it. The neighbors must practice it too.

Mr. Zercher: If a good coat of whitewash is put on in the spring and that is followed up persistently, it will aid materially in keeping the borer in check. The eggs are laid on the top, the moth hatches out and must eat to live, and they eat the whitewash and die.

Mr. McDonald: In connection with borers, we use asphaltum as it is very elastic and pliable. This might be used as a preventive for borers. They have been experimenting with it for eight or ten years.

Mr. Stewart: The California station sent out a bulletin a few years ago. It was discussed at Corvallis with a recommendation of a different grade of asphaltum. It is not necessary to take the borers out where you use asphaltum. In one orchard, three or four years old, which was not as large as it should have been, I told the grower to get the D grade. He thought he had killed the trees. But the C grade will melt and run down the trees. On a three or four year old orchard there is no danger in using D grade. On young trees the use of half and half C and D grades will be found most effective. Clean the trees and coat with this asphaltum. The borers can neither get in nor out. They claim that they killed 90 per cent of the borers in the trees.

Mr. Allen: Has he noticed any check on the trees from constriction?

Mr. Stewart: Not to any extent, say one-sixteenth of an inch, maybe one-eighth of an inch. It will expand as the tree grows.

Mr. Barss: Asphaltum has a very peculiar and satisfactory quality of yielding to very gradual or slight pressure. C grade of asphaltum will always look shiny as the dust settles through it, so the tree would suffer nothing from constriction. At some of the tests of asphaltum, it was found that the harder grade of asphaltum could be bored through, and the jaws of the borer got stuck in the lower grades. Even if it is good for the root, it is not necessary to put it all the way up the trees. I have seen scald as a result in a number of cases where the trunk was plastered with asphaltum. Use it only near the base of the tree and put some whitening material over it.

Mr. Norton: A man in Malheur county had borers in his trees, but he made use of a wood veneer. The borer rarely goes more than eight inches above the ground. We find we can cut the borer trouble down to less than 90 per cent in that county.

Mr. Mahan: On my place in Malheur county, near the Snake River, in fighting the borer, my best success has been with whale oil soap, applying it three times in June, July and August. In that way, I have practically kept them out of the prunes.

Mr. Minton: The thought just occurred to me. Mr. Zercher said the use of whitewash had killed them. Mr. Steward suggests asphaltum. Why not put arsenate of lead in both of these so that it would be sure to kill them?

Since Mr. Reynolds was unable to appear, President Paulus read the paper prepared.

COMMERCIAL FERTILIZERS AND RESULTS OBTAINED

By L. T. Reynolds, Salem

The subject of fertilizers for the orchard is not a new one, for it is discussed at nearly every meeting of fruit growers.

This facts indicates the need of more information on this subject, and also shows that the fruit growers of Oregon realize the necessity of using some method of restoring to the soil the elements they are constantly taking away in the form of apples, prunes or other fruit.

The sooner we recognize our obligation to keep up the fertility of our orchards, the surer we are to continue to raise profitable crops.

Granting that our orchards need fertilizing, the question immediately arises, what shall we use? There is no doubt in regard to the value of using all the stable manure we can produce on the farm, but the average orchard does not sustain enough farm animals to produce manure sufficient for extensive fertilizing, and comparatively small amounts are longer available from the nearby towns.

The cheapest method of obtaining nitrogen, and at the same time preserving humus in the soil is the use of a cover crop of vetch or clover.

In one of our orchards which has been growing a winter and spring crop of the spotted leaf clover, "Medicago Maculata," the result has been very noticeable, the growth has increased, the leaves are greener, and the prunes have set better than in other parts of the same orchard.

Owing to its early growth in the spring we have found it to be a very desirable hog pasture for several weeks before turning it under. This leads to the suggestion that where hogs, poultry, or cows can be kept in connection with the orchard, not the least item of profit may be found to be the fertilizer which may be obtained therefrom, for use in the orchard.

If we are making use of these sources of fertilizer can we still afford to use commercial fertilizer? We know of a number of instances where commercial fertilizers have been purchased and used when the results seemed to show that the money so spent was wasted. This does not prove, however, that the use of such fertilizers may not be profitable when used with judgment.

The best way for the orchardist to determine whether it will pay him to invest in a particular fertilizer is to ask the soil. Do not buy tons of nitrate of soda, potash or phosphoric acid, or even complete fertilizers (so called) without knowing from experience on your own soils that such fertilizers will give you results. Buy a few sacks, stake out some plots, leaving check plots without any fertilizer, and compare results. In this way, after a few seasons you can determine for yourself which are the profitable fertilizers for you to use.

Having made some tests during the past few years, I have been asked to make a report to you of the results obtained in my orchard. In some of these tests the results have been inconclusive, either because of conditions of weather or because sufficient time has not yet elapsed in which to come to any definite determination of final results.

Before reporting on these tests, however, let me give the number of pounds of the three chief plant foods extracted from the soil in the removal of 1000 pounds of fruit from the orchard, as given in an Oregon Bulletin (No. 50.)

	Potash.	Phosphoric Acid.	Nitrogen.
Oregon prunes	4.45	1.30	2.20
Oregon cherries	2.01	.55	1.69
Oregon apples	1.90	.10	1.30

Before the war, and the resulting high price of potash, having read in many reports that Willamette Valley soils were generally deficient in available potash, and that this element was especially needed in the prune orchard, I made several tests by sowing during three successive years on small plots in the prune orchards, Muriate of Potash, as follows: Plot 1, 5 pounds per tree; plot 2, 7 pounds per tree; plot 3, 10 pounds per tree; plot 4, check.

This test on the prunes was without apparent result during the test, there being no more prunes and the size of the fruit being not materially different in any of the plots, with the exception that the second year of the test, the trees receiving potash, though not having quite as many prunes, were considerably larger in size.

A similar test on apples, applying Muriate of Potash, 6 pounds to the tree, showed no difference in crop yield or growth of tree, but the Baldwin apples on the trees fertilized appeared much higher colored.

In the spring of 1916, a representative of the Union Meat Company asked the privilege of making a test of their orchard dressing, knowing that I had made a test of one of their other fertilizers two years previous, without adequate results. Accordingly, fifteen trees were fertilized in the spring of 1916, using their orchard dressing, applying eight pounds to the tree.

These trees were Italian prune trees about thirty-three years old, which have been regularly cultivated, but have made very little growth for several years. During the growing season it was apparent that the trees were making a more thrifty growth than the other trees in the orchard, the leaves being larger and deeper green.

At drying time the prunes from this plot were kept separate, as well as were the prunes from the fifteen trees in the check plot, the crop in the whole orchard being very light.

The result in dried prunes was as follows: Fertilized, 463 pounds dried, average test 34; unfertilized, 401 pounds dried, average test, 41

Taking into consideration the price at which prunes were selling at harvest time the value of these prunes was:

Fertilized, 463 pounds (30-35 test) @ 7c	$32.41
Unfertilized, 401 pounds (40-50 test) @ 6½c	26.06
Advantage in fertilizer	$ 6.35
Cost of fertilizer, 120 pounds @ 3½c	4.20
Apparent profit	$ 2.15
Apparent profit per tree, $0.1433; apparent profit per acre	$14.33

Due to the better growth made by these trees that were fertilized in 1916, the buds were better developed and a better crop was set the present season, though no fertilizer was applied to this plot this spring. yet those who visited the orchard could readily pick out the trees by their thrifty appearance.

The same fertilizer was applied on another part of the orchard this year, but the results were not so marked as regards growth, the season being too dry perhaps, to secure the best results, though the prunes did not drop as extensively and a better crop was harvested, but since it covered about two acres and we were not able to give it our personal attention, no attempt was made to keep the weights and tests when the prunes were brought to the drier.

Three other tests were made, each plot consisting of 36 trees, one plot receiving nitrate of soda, one plot phosphoric acid, and one both nitrate of soda and phosphoric acid. These were applied rather late in the spring, and the results were not sufficient for any definite determination, but observation showed that the trees receiving nitrate as well as those receiving nitrate and phosphoric acid, made slightly more growth and held their fruit and leaves a little longer than the other trees.

It appears to me, that the fertilizer should be applied very early in the spring in order that it may have the advantage of some of the spring rains and thereby be of some effect during the early growing season.

No one realizes, better than myself, that these tests have been far from conclusive so far as crops and profits to be obtained from the use of commercial fertilizers are concerned.

It has proven to me one thing, however, the owner of an old prune orchard, by use of judicious pruning, application of fertilizer and good cultivation, can so stimulate his old trees, that they will again produce, good thrifty fruit spurs, and by renewed vigor, again bear profitable crops.

Question: Did you put on your fertilizer sometime in January or February?

Mr. Paulus: No. The Union Meat Company, from which we bought the fertilizer, told us we could put it on as late as the last of April or the first of May. I tried this and got no results this year, but I believe I will get some benefit next year. I put on more fertilizer than was suggested by the company. I think the company did not realize the size of the trees in our orchards. I used eight or ten pounds to the tree instead of five. Most of the trees are large trees and there is a big space to cover.

Mr. Allen: I am going to make just a little remark, at the risk of repeating. This fertilizer work and fertilizer is more complex and more important than the majority of the growers imagine. I don't believe enough stress has been laid on this one subject. You can buy a complete fertilizer, apply it, and have a check on what that fertilizer is doing. This is what you lack. You have applied a fertilizer consisting of several elements, but you do not know which particular element has done the work. We tried it in Southern Oregon on alfalfa. We got results from superphosphate. We all ran to superphosphate. We spent thousands of dollars and thought we had a check on it. We should have had a check, not for superphosphate alone, but one for fertilizers containing phosphoric acid, and one for those containing sulphur.

Ultimately we found out that it was the sulphur which was producing results. We were paying enormous prices for sulphur. You will apply some one of these fertilizers and you will be giving an enormous price to somebody for something you are throwing away. You must find in some way just what element you need. I have seen soil in Southern Oregon which bears out my theory. Around Medford, the soil is one of the richest in lime in the state (we have 375,000 pounds of lime to the first acre foot) but we also have soil heavily impregnated with lime which, upon the application of other kinds of lime, will give results. You may add fertilizer to the soil and get results in the form of gypsum or land plaster, but you could add sulphur and get results without paying for the land plaster. The subject of fertilizers is receiving a very big proportion of our attention. We are going to run into it too deeply and we are going to waste thousands of dollars. There isn't a county in the state of Oregon that shouldn't have a county agent. There is a man who will help you make an experiment. We who have got them should fight to keep them. The ordinary farmer is not fitted to make observations because we are not trained in making observations. We think we have kept a check on things and are thoroughly convinced of the cause which brought about certain results, but it may not have been the fertilizer at all, it may have been climatic conditions. But we always attribute it to the thing we have done. I would suggest that no experiments be done without the co-operation of the college or the county agent and I can point out the aid you can get. You can't get a check from one orchard or one season. You may get results and attribute it to a special quality in your fertilizers, while it is likely that it is another attribute in that fertilizer which has produced that particular result. Fertilizers are going to be hard to get, particularly nitrates, and they should not be wasted on ground which does not need them.

Mr. Miller: I want to emphasize the suggestion made by Mr. Allen. Our county agent should be utilized in just such a manner as suggested. Another thought to be emphasized is the idea of utilizing our own resources. I used lime and potash and phosphorus and nitrogen. I got splendid results only from the nitrogen. I came to the conclusion that the wisest thing to do is to plow in vetch. I don't have to buy any nitrogen on the red hill land in Yamhill county, but get excellent results from the use of vetch alone. Another phase of fertilizer is the Manchurian soy bean cake, which contains a great deal of nitrogen and phosphorus. Two years ago, it was by far the cheapest fertilizer. It is used very extensively all through the Orient, especially on sugar plantations. In the Hawaiian Islands they are now using enormous quantities of it. It may be the most economical fertilizer; however, so far as most of the land is concerned, I want to commend my experience with vetch. Immediately after taking the prunes off, sow the vetch in the orchard and plow it under next spring.

Mr. Cook: Is the soy bean cake the same as we feed to poultry? I am using it with poultry with good results.

Mr. Miller: Yes sir. Outside of transportation, which is very high now, it is a very cheap product, both for poultry and as a fertilizer.

Mr. Macrum: I wish to add just a little to Mr. Miller's talk in regard to vetch. The question of fertilization depends upon the quality of the fertiliser. In this country the chief thing is nitrogen. The cheapest cover crop, the cheapest fertilizer we can use is something we grow right at home, and that is vetch. Put it in from the middle of August to the middle of September, turn it under in the spring. There is not enough humus in the ground. Vetch can be combined with red rye. You can over-nitrogenize the ground until it will take two or three years to restore balance. Sow a small crop each year; in that way each year put in a cover crop so as to feed your trees the right amount of nitrogen and keeping the right amount of humus, by using what you have at hand. You can get vetch and rye anywhere, and you can keep your soil in shape at a very little cost.

Mr. Stolz: Before we pass this question of fertilizers, I want to bring up the question of lime again and give a little expression of my ideas or investigation along that line. We all have to concede that lime is not a fertilizer; in other words, we can't use it and get results as a fertilizer, but it is a stimulant. My idea, for Marion county, is that lime will furnish a certain element in the tree growth that will give us a better tree ,a healthier tree, a better-fibred tree, and put into the blood of the tree an element that the tree needs. Some advise sulphur, others say that sulphur has no value, and yet if it is absorbed in the root of the tree, there is a certain element that the sulphur can furnish. As a matter of fact, all spray is largely of benefit to the ground around the tree by the absorption of that which falls upon the ground and which gets into the soil. So when we are passing on the question of lime and say it is not a fertilizer, are we not misleading our grower? Am I right?

Mr. Krause: Lime is a fertilizer. It is needed in the plant. It is one of the things which we cannot do without in plants which we grow, of agricultural purpose. It is taken into the plant organism, aiding not only in building up the cells themeslves, but in neutralizing other substances. The same thing is true of sulphur. Sulphur is used in many cases when a fertilizer is needed for the plant, particularly alfalfa, and it becomes of distinct benefit as a fertilizer. None of our higher plants absolutely lack lime. There are soils which are not acid which are greatly benefited by the application of lime. There are soils which are acid which are not benefited.

Mr. Paulus: When I was going through Clark county, Washington, I saw an orchard where a man had been putting on about ten tons of cheap manure on his prunes. He had an enormous crop of prunes. He told me that, when he bought the place, eight years previous, he paid about $800 an acre. . His new neighbors told him he had been stung. He soon began to believe that they were right as there was no crop the first year and the next year about half a ton. Then he began to use this fertilizer which he bought from the Union Stock Yards at Portland. at a cost of $1.50 a ton f. o. b. Portland, with 60c freight charges. making it $2.10 a ton delivered at his unloading sation, with the following results: third year, 1¼ tons; fourth year, 1¾ tons; fifth year, 2¼ tons; sixth year, 3 tons; seventh year, 3½ tons, eighth year, 4¼ tons. From the looks of his trees, if he succeeded in bringing them to maturity, he should get the amount he was looking for this year, 20 bushels of prunes apiece on trees which he said were thirty-five years old.

Mr. Macrum: I am a glad endorser of the county agent. I think it would be a good thing for us to pass a resolution of endorsement for the work they are doing, therefore I move that it is the sense of this Association that the system of County Agents is a good one and that we ask for its perpetuation.

After much discussion, and the proposal of amendments, Mr. Macrum withdrew his motion with the consent of his second.

Mr. Parks: I move that this matter of County Agents be referred to the Committee on Resolutions to report this afternoon. Carried.

President: J. J. Russell told a meeting at O. A. C. about two years ago of the enormous yield he was getting by the use of manure, but there was danger of getting too much of a yield. The prunes were getting so that they dried red.

Meeting adjourned.

Meeting called to order at 2 p. m., by President Paulus.

DIVERSIFIED INDUSTRY THE BASIS OF OREGON'S PROSPERITY

By H. B. Miller, Director of the School of Commerce, U. of O.

In taking as my subject today the statement that "Diversified Industry is the Basis of Oregon's Prosperity," I am not trying to present a new theory but merely to apply a fact as old as history to our particular epoch and our own immediate locality. A diversity of industry is the essential foundation of every highly prosperous community. Indeed it seems apparent to me that no high type of civilization can be attained without a great diversity of occupation for the people. If you study the inhabitants of any country in which the same few occupations are followed you will find there a low order of civilization. The people do the same kind of work, eat the same kinds of foods and look and act monotonously alike. Take for instance, the Chinese coolie class. In their own country they all perform much the same kind of dull labor, they all live on fish and rice and all look as much alike as peas in a pod. Even in America, in communities where all the inhabitants are employed at the same occupation there have come to be certain types such as the "po' white trash" of the Southern cotton mill districts.

We have in Oregon the greatest variety of natural resources of any part of the world of equal area. It is my profound belief that the height to which we shall rise—and I speak of the things of the spirit as well as of material prosperity—depends upon our wise utilization of all we have. I am going to try to prove to you that we have here all the natural advantages that make for the highest type of civilization. If properly developed the use of all these resources would lead to a diversity of occupation of our people never before known in any country.

We have a sufficient variation in climate and altitude in different parts of the state to afford a wide range of nautral products and at the same time to enable us to cultivate all the crops grown anywhere in the temperate zone and many of those grown only in the semi-tropics. We have water power to an extent realized by but very few and in addition to all else we have the tremendous advantage of being on the sea, thus facilitating interchange of commodities with all the world and giving us opportunity for the development of industries for which the raw materials are not produced within our own borders.

Now what I am hoping to bring home to you today is the fact that we are just now beginning to make use of all these diverse advantages and I am trying to make you feel, with something of the strength of my own conviction, that it is the great task of the immediate future—the task of all of us who are Oregon citizens, not merely of a few captains of industry—to work out the salvation of Oregon through development of her vast diversity of resources.

The industrial history of Oregon is "short and simple" like the "annals of the poor." It began with the fur trade, which as you know was carried on for the aggrandizement of a few men who never saw the country and whose agents had no thought of permanent occupation of the country. At a later date, when home-seekers began to come in agricultural pursuits were of course taken up and such industries were established as were required to provide for the immediate wants of the settlers, for necessity is the mother of invention and of industry. Flour mills and saw mills were put in operation and for pretty much everything else besides lumber and flour that they needed in the way of manufactured articles the settlers sent "back East"—and we have been sending "back East" ever since. It got to be a habit.

This is of course the history of every pioneer country. First came the adventurers who exploited the country, then home-seekers who made settlements and established primitive industries. After that the country "just growed," each locality according to the energy and foresight of its leaders.

Perhaps the greatest trouble with the development of Oregon has been that it has been too easy—we had all the gifts the gods had to bestow and so, in accordance with human nature, we have gone the way of least resistance. We have developed those resources that were most abundant and ready-to-hand, and let the others wait. If we had had to struggle against all the odds that the older countries have struggled against perhaps we would have made greater efforts and gone farther. But what I want to point out to you is how much farther we can go in future than any other country ever has gone—how much higher and finer a type of civilization can be established here on the farthest western shores than any the ancient or modern world has known if we but make the wisest utilization of what is ours by the bounty of nature.

To make clear to you that I am not merely indulging in a flight of the imagination perhaps it would be just as well to point out, by contrast, wherein we have all that goes to make a marvelously prosperous community. Take for instance, the city of Belfast which is typical of the great industrial centers of the world.

Belfast is by all odds the largest manufacturing city in Ireland and is one of the most successful and prosperous manufacturing cities in the world. And all of this vast volume of business, which supports a population of 100,000 has been built up with not one of the natural advantages that are so abundant in Oregon we don't even know what they are. Absolutely all of the raw materials used in the huge factories in Belfast are imported from outside of Ireland.

The two largest ship-building plants in the world are situated at Belfast—and Ireland has no timber and no iron. The biggest industry of Belfast is the linen industry and not more than 5 per cent of the flax used is grown in Ireland. Before the war it was brought from Germany, Belgium and Russia largely.

The largest plant for the manufacture of tobacco in the world is at

Belfast and the product is obtained in large part from the United States, the Philippine Islands and from Cuba. Likewise the largest rope manufacturing plant in the world is at Belfast and the hemp is imported mostly from the Philippines.

The locality about Belfast is a great wool manufacturing center and all of the wool is brought from a great distance—South Africa, New Zealand and large quantities from China.

In connection with the linen industry there has grown up at Belfast a variety of related industries employing the labor of women and girls, notably embroidery and lace making. These related industries that offer opportunity for the women in the families of the men operatives to become wage earners must not be overlooked in plans for our industrial development here for the time will never come again when the American ideal of support for the whole family on the man's wages will be realized. Not because the wages of men will not increase but because our standards of living will rise in proportion.

In addition to surmounting the great difficulty of having no natural resources the Belfast district has built up this tremendous manufacturing center under several other severe handicaps, the most serious being that the surrounding country produces practically no food stuffs for feeding this vast army of factory operatives. The food for the workers is imported from all over the world. Another serious handicap is in the short day. Through a large part of the year the darkness falls so early that it is necessary to light the factories—even the great shipyards—after 3 o'clock in the afternoon. In fact the only natural asset that Belfast has, to my knowledge, is the water supply. The city has excellent water. Another of the big industries there is the making of Ginger Ale and in this, at least, a native product can be used.

While it is true that Belfast is perhaps a little worse off in the matter of natural resources to draw on for manufacture than the other big manufacturing cities of the world, her situation is very nearly typical. London, Glasgow, Paris—and Berlin before the war—are almost altogether dependent upon products brought from a distance for the raw materials for their manufactures and equally dependent for food for the workers. As all the world knows these cities are suffering intensely because of this fact just now.

In contrast to all this let us look at our own locality and see what we have to make into manufactured articles for the rest of the world and what an abundance of things we have with which to feed, clothe and shelter our own people besides providing them with a multitude of comforts unknown to the workers in the great centers of the old world.

Let us begin with our leading product—lumber. The United States Forestry department estimates that there are 131 billion feet of standing timber, or one-fifth of the entire stand of timber in the United States, in Oregon. According to the forestry department's experts there are 54 varieties of woods in this state in sufficient quantities for commercial use. Until very recently we have been chiefly occupied here in manufacturing two or three varieties of these woods into lumber and selling it thus in next to a raw state. We have done so little else in the way of manufacturing that the whole community has been prosperous or subject to violent "slumps" according to the rise or fall of the lumber market. If we had been manufacturing some of the other 54 varieties into articles the world wants, not to mention a thousand and one other products which Oregon can produce besides lumber, we need not have had known so much about hard times.

But we are learning. We are now putting some of this lumebr into ships and by the addition of this one industry we have added to the pay rolls in the city of Portland alone 10,000 employees. Recently also, we have begun to make freight cars and just at this time large quantities of spruce are being cut in Oregon and Washington for use in aircraft construction.

Another related industry in connection with lumbering, which is now on a sound commercial basis and destined, I believe to become one of our leading industries, is furniture manufacturing. Portland should become as great a furniture manufacturing city as Grand Rapids for she has every natural advantage for the success of this line of manufacture. We produce few hardwoods in large enough quantities for furniture manufacturing but we can easily get what we lack in this character of lumber from the Orient in exchange for our soft woods which are in great demand there. If there were not so many other products besides lumber to which I want to call your attention I would give you a long list of other articles that might profitably be manufactured here from some of the 54 varieties of woods. A few others are now being made here, such as paper, tool handles, woodenware, etc.

Our natural resources in the way of mineral products are almost forgotten nowadays by the average Oregonian but it is interesting to note that our production of minerals for last year amounted to $6,000,000. Oregon mines produce gold, silver, lead, copper, chromium, platinum, antimony, quicksilver, tungsten, some coal—from Coos county—and there are important lime and cement deposits.

We have demonstrated that flax of the best quality can be grown here and its production will one day lead to the establishment of a great industry. Our fur-bearing animals still produce $100,000 annually although we think of fur trading as a business that passed away with pioneer life.

But it is in the matter of food production that we are particularly blessed. We have the soil, climate and acreage in Oregon that will produce food in sufficient quantity for as densely populated a manufacturing district as exists on the globe today. And the fortunate part about this is that our food stuffs are of such a wide range that they must needs add greatly to the health and good living of our people. For it is a well established fact that a variety of foods is essential to the best physical and mental development.

In agricultural and horticultural pursuits it has been demonstrated that anything can be raised here that can be in any other part of the world except those things grown only in tropical countries. Unfortunately in the case of a number of important products we have discovered that we could grow them and stopped at that, giving all our attention to the production of a few "known quantities." For a number of years we made a serious mistake in horticulture by over-specialization with the inevitable result that many communities suffered bankruptcy when the apple crop was short or the market low for several successive years.

But a few figures on the amount of fruits marketed last year will show that we are getting away from over-specialization and putting Oregon horticulture on the wiser basis of diversification:

Apples, 4,000,000 bushels.
Dried prunes, 30,000,000 pounds.
Fresh prunes and plums, 10,000,000 pounds.
Pears, 500,000 bushels.
Peaches, 1,000,000 20-pound boxes.
Cherries, 15,000,000 pounds.
Grapes, 6,000,000 pounds.
Raspberris, 3,000,000 pounds.
Strawberries, 15,000,000 pounds.

Loganberries, 7,000,000 tons.
Cranberries, 5000 barrels.
Walnuts, 500, 000 pounds.

Then take the matter of fish. The only fish in Oregon waters that are now commercially profitable are halibut, ling cod, salmon and red snapper. But there are any number of other fish just as edible and to be secured in large quantities but the market for them has not been developed. We have oysters, clams, sand dabs, soles, flounders, smelts and herring. The salmon catch in the Columbia river alone last year amounted to $5,000,000.

We are now making a very good showing in the matter of production of live stock. There are estimated to be on the farms of the state at this time:

Sheep, 2,500,000 head.
Hogs, 400,000 head.
Beef cattle, 500,000 head.
Dairy cattle, 200,000 head.
Horses and mules, 300,000 head.

The production of condensed milk has grown to large proportions during the past few years and will likely become of much greater importance.

But even with all this, in view of our potential activities in commerce, it is evident that we have not gone much beyond the pioneer stage up to this time. We began, before there were railroads to transport goods to us, to manufacture the necessities—lumber and flour principally—and lumber and flour are still our chief products for export. Such products as we send back to the Eastern states or ship abroad are in a raw state or in the first processes of manufacture. We still have the habit of sending "back East" for an infitine variety of things that could just as well be made here.

This was all very well for a pioneer community. All honor to those sturdy men and women who blazed the trail for us and laid the foundations, in untold hardship and endurance, for a splendid commonwealth. They bequeathed to what I believe, in all sincerity, and speaking with a wide knowledge of the world, to be the place above all others endowed by nature with the gifts which, wisely used, will lead to the highest form of civilization. For, I repeat, the greater the diversification of industry, the wider the range of interests of a people, the higher will their civilization be.

Our pioneer parents followed their vision of a land flowing with milk and honey. They found a wilderness which they tamed and passed on to us. Upon ourselves and our children devolves the labor and the privilege of making it in truth a land "flowing with milk and honey." We can, and shall do it—if we but lose not the vision—for nature surely intended this to be the home of the richest and happiest of peoples. But I say if we lose not the vision, for now, as ever, "without vision the people perish."

Mr. Miller: I want to offer a tribute to Dr. Caldwell, that splendid character who inaugurated this Society. If Mr. Dosch were not present, I would like to pass a handsome compliment to him for the bringing to us of the walnut industry. He fought for it when we laughed at him. He talked to us in spite of ourselves, made us listen to him. He finally made us believe that the walnut industry was one of the greatest industries of this state. The head of one of the great canneries in California said: "The berries of Oregon cannot be excelled anywhere in the world. If we of California had the opportunity of producing such berries as they produce there we would have an enormous industry." And so in a great many ways we are discovering things that you never dreamed of and I wish I could tell you of what I believe to be the future development of Oregon. Over and above it all stand the future development of the manhood which we are going to develop here. The world will not find in a thousand years such a deveolpment as leads to the development of human character as exists right here in Oregon.

The chair appointed the following legislative committee: Robert C. Paulus, Salem; H. B. Miller, Eugene; Dr. Macrum, Mosier; Ben Worsley, Astoria. L. T. Reynolds, Salem.

A motion was made and carried that the minutes of this meeting be printed in pamphlet form and distributed as usual.

The chair appointed the following auditing committee: Albert Brownell, C. A. Burt, J. B. Pilkington.

The report of the committee on resolutions was read and adopted. It is as follows:

1. Resolved, That we, the members of Oregon State Horticultural Society, earnestly urge that the Oregon Agricultural College make a survey of the state and designate the various localities best adapted for locations for canneries and preserving plants for fruits, berries and vegetables; and be it further

Resolved, That copies of this resolution be sent to the governor for presentation to the legislature and to the president of the Agricultural College.

We suggest that in making this survey the services of the county and government agents be utilized as well as the services of the representatives of the college.

2. Resolved, That in the death of Mr. Williamson, this Society, as well as the state at large, has offered a very severe loss. For years he has been recognized as a leading authority on all matters pertaining to horticulture. He has been one of the most enthusiastic members of the society for many years and one of the most efficient public servants of the state, being always ready to give his kindly advice and draw on his store of knowledge to anyone seeking his aid.

Resolved, That the secretary be instructed to send copies of this resolution to his family, together with the records of the memorial services held at this session.

3. Resolved, That the Oregon State Horticultural Society approves of the employment of County Agents, as we consider their services as of special value to the horticultural interests of the state. Be it further

Resolved, That a copy of this resolution be sent to the governor for presentation to the legislature, also to the county judges and commissioners.

4. Resolved, That this Society offers its sincere and high appreciation and thanks to the officers and members of the Commercial Club for the courtesy in extending to us the freedom of their hospitable Club Rooms for our meetings and social functions. To Mr. Robert C. Paulus for his excellent manner in caring for our Society during his presidency, and impartial and courteous rulings as our president; in relinquishing the chair to his successor, wish him continued success, prosperity and good health. To our efficient secretary, officers and particularly to those gentlemen who have so kindly contributed so valuable papers for the uplifting of our Society and general prosperity of the fruit interests.

DR. MACRUM,
Chairman of Resolutions Committee.

Mr. Worsley: I do not believe that there is, with a very few exceptions, any man who is on the farms of this state or any other state in the United States of America that absolutely knows the soil and the conditions of the soil that he is farming and trying to make a living from. I want to give you just one concrete illustration of my own individual effort, when I tell you that I bought twelve sacks of potatoes and I planted them on one acre of land. When it came to harvesting that crop, after giving them all the care that my limited knowledge allowed me, I had the satisfaction of digging out eight sacks of potatoes. My individual case applies to many men in the state of Oregon, who are wasting a life's energy trying to make a living for themselves and their families out of the soil. And this, at a time when the government is urging us to produce more from the soil to feed our own people, the allies in Europe and our own soldiers on foreign soil. Every man should know and no man should waste his time in trying to do things about which he has no knowledge. The O. A. C. is educating men who are competent to help us do this work, by illustrating to us and showing us by positive and actual experiments that we can better our conditions if we will follow the advice of the man who is an expert. I understand that, right here in Marion county, there is a petition being circulated, to abolish the office of county agent. It is a shame and a disgrace that any man or woman will put his name on that petition. If that man has the qualifications and ability to go out before the people and improve the conditions of the man on the farm, he is a valuable asset to Marion county. It makes no difference what position a man may occupy if that man swells and doesn't grow, I want to tell you it is a shame if he doesn't burst. But if he grows, he will not burst. We want the man who grows. We want the man who has grown, we want the man who can teach us and I trust every vote in this assemblage will be for this resolution, and that a copy of this resolution will be sent not only to the governor and the legislature, but also to every county court in the state. Friends, let us vote the resolution and let us stand by the resolution and let us go home and see that our people stand by until there is an expert in every county in Oregon.

Mr. Stolz made a motion that the secretary make it a special point to disseminate the information to the fruit growers and agriculturists that by sending $1.00 to the secretary, they can get the proceedings and have the benefit of the papers that have been read here. Carried.

Mr. Worsley: The newspapers of this state, as well as other states, have adopted at this time an iron-clad rule that they will not publish anything coming to them in an advertising way, lauding or setting forth any facts from any organization that charges a fee for profit. We all realize that the matter that has been brought before this Association in the last few days is of such nature that any man or woman in the state of Oregon would benefit by its knowledge. The lack of publicity, the lack of getting these matters before the people of the state in their fullest sense is something that should be brought before the people through the public press of this state, if possible. Our membership is small compared with the number of people who could be benefited by these proceedings. If this matter could be brought to the attention of the weekly papers throughout this state, and this matter could be pushed through the weekly journals and daily papers, there is untold value there to every one in Oregon. It could not be purchased for money by the majority of people. If the people will practice what these papers advocated, it will mean hundreds of thousands of dollars saved. It seems to me that some method should be taken to bring this matter to the public press and not only have it published in an annual book but also in the papers. Here is where we get it and we want to tell it to the other fellow. We can show what we want to do and what we can teach the other fellow. Let us try and tell the whole story, that we have a magnificent Association, that we have put out papers of untold value to every one, man and woman, in Oregon.

The chair delegated the duty of getting the matter before the press to Secretary Minton and Mr. Dosch.

OBSERVATIONS ON PRUNE EVAPORATORS

By F. M. Brown, Marion County Agriculturist

Picking.

A discussion of prune evaporation and all factors effecting such must necessarily commence with the harvesting methods. The normal season for harvesting prunes in the Willamette Valley is from September 10 to October 5. We find, however, that during the past few years there is an increasing tendency on the part of the growers to hurry the season. In other words a great many growers are beginning as early as the 1st of September and finishing as early as the 25th or 10 days in advance of the normal season. With these facts before us then let us consider the effect of this early harvesting.

Through experiments carried out at the Oregon Agricultural College it has been found that the following figures are fairly accurate showing the loss due to this early harvesting. There is a loss in weight of fresh fruit because the sugar contained increases very rapidly during the last three or four days that the prunes remain on the tree. Experience covering two years give the following figures. The loss in weight of fresh prunes due to shaking is 6 per cent. Since the sugar contained in the prune vitally effects the drying quality it is natural to find that prunes which are shaken from the tree dry lighter than those which drop naturally. The average difference over a period of three years shows a gain in weight in favor of prunes dropping naturally of 4.5 per cent. This means then that the growers annually lose 11 per cent of the weight of his dried prunes by harvesting too early. Add to this the cost of shaking which runs from $3.00 to $6.00 per ton and estimating the price on a basis of $125 per ton on dried fruit, we find the total loss due to this early harvesting amounting to from $18 to $20 per ton or more than enough to pay the cost of cultivating, pruning and spraying the orchards. To further substantiate this fact, observations were made during the seasons 1912-14 and 1917, those seasons which are particularly noticeable on account of the difficulty experienced in getting the prunes from the trees. These observations reveal the following facts. First, that after resorting to severe shaking and clubbing there still remains on the trees at the end of the season a number of prunes. An inspection, however, ten days later revealed the fact that not a single prune remained on the trees, but scattering prunes on the ground indicated that at the proper time prunes dropped of their own accord.

Traying.

Let us now take the question of traying. There are many factors in connection with the traying of prunes where greater efficiency can be obtained. For instance, it is found in one case by careful experiments and substantiated in many others by observation that enough rotten prunes were placed on the trays to show a net loss of $2.73 per ton. Another factor is the tendency not to fill the trays to their greatest capacity. This has been found to account for a loss in the drying cost of $4.27 per ton. This is based on the fact that it costs just as much to send a tray through the drier filled to 80 per cent of its capacity as it would to send it through completely filled.

I was glad to hear Mr. Paulus make the statement that the prune which has been lyed heavily does not process as nicely as do those dipped without the use of lye. I have this same statement from all of the principal prune packing plants in Oregon. From experiments carried out on a commercial scale we have found out that with proper drying methods the use of lye is not necessary and not only effects the processing quality of the prunes but the appearance and quality of the product itself.

I think some steps should be taken to grade the prunes into at least two sizes before they go into the evaporator, since it is a well known fact that the small prunes on the same tray with the larger ones will not dry in the same length of time. This means that either the small prunes will be over-dried of the large prunes under-dried, or both. In either case hand sorting will be necessary.

Evaporation.

There are a number of factors which influence the evaporation of prunes. For the most part growers are content to base their conclusion as to the efficiency of any particular evaporator on the time required to dry a tray of prunes. This is not necessarily a correct basis since the difference in drying time very often is not sufficient to warrant the difference in dried weight. In other words, since we are selling by the pound it would seem the more logical way to base our conclusions on the weight of dried fruit obtained from any given amount of green fruit.

Climatic conditions assert a marked effect under our present methods. Experiments and observations covering a period from 1911 to 1917 shows that the average weight of dried prunes per bushel of fresh is 17 pounds for rainy seasons and 19½ pounds for dry seasons. Careful experiments during that same period brought to light the fact that where conditions could be controlled 20.3 pounds for rainy seasons and 24.4 pounds per bushel for dry seasons could be obtained. The effect of drying time on the drying percentage or weight per bushel is not very marked. For instance, a difference in drying time from 29 hours to 77 hours gave a difference in dry per cent of only 4 per cent, in favor of the shorter time. There seems to be little or no difference in drying per cent so long as the drying time is kept below 30 hours and above 15 hours. An additional advantage of the time as noted above is found in the more attractive appearance of the finished product.

In order to obtain a drying time within the limits noted above the following conditions were found essential. A temperature in the beginning not lower than 120 and preferably as high as 140 degrees. A finishing temperature not higher than 180 degrees and not lower than 165 degrees. The maximum temperature for the finish would depend largely on the circulation of air. At no time should the circulation of air drop below 660 feet per minute and while we have no definite figures to give as to how high a circulation would be desirable we have found that with the air circulation as rapidly as 1000 to 1200 feet per minute, very excellent results were obtained.

Another interesting fact in connection with the circulation of air is to the effect that the humidity of the air as it passes out is not sufficient to hinder its use a second, third or even greater number of times. In other words there is no reason from a moisture standpoint why the air should not be returned to the furnace pit again and again. By reheating with perhaps a small amount of new air added a great saving of fuel is effected, since in most cases this could be returned at a temperature fully twice as high as that of the outside air. The question in connection with this, however, is, can a means be obtained of returning this air to the furnace at a cost small enough to warrant its adoption.

Summing up then some of the facts in relation to prune evaporation we find it possible to decrease our cost of harvesting and increase our profits by allowing the prunes to ripen more fully. We can make more attractive products by omitting the use of lye and substituting a more rapid circulation of air in the evaporator. Beyond this there is still considerable experimental work to be done and we trust that the Oregon Agricultural College with its new facility for carrying on the work will be able to render some valuable assistance to the prune growers in the near future.

Mr. Norton: An analysis made by our chemist showed 11 per cent moisture.

Mr. Brown: Tests made by O. A. C. give 15 per cent as a rule.

Mr. Paulus: Doesn't the moisture contents of the prune depend on the heats used in drying? For instance, if you take a lower heat against a high heat.

Mr. Brown: I think that this is quite true.

Mr. Paulus: In looking at a number of products dried by low heat, I have seen them—in buying them in packages, after sold—I have seen that they go moldy. I have come to the conclusion that high heat is necessary.

Mr. Brown: The drying process has a great deal to do with sugar content of the prune.

Mr. Paulus: I was reading of some investigations made by Pasteur in regard to drying and preservation of foods. The drying of malt at a low temperature, at a high speed, produced a low sugar content in the malt, but if, in the last part of the drying, the heat were increased a considerable extent, the beers produced from the malt would be high in sugar content. The same thing is probably true of prunes.

Mr. Brown: In our experiments at O. A. C., those prunes which were dried quickly and under high temperature, very rarely showed any spoiled, but those which underwent long drying periods and low temperature, showed a very high rate of spoiled.

Mr. Norton: You know we use a circulating drier, the same air over and over. It bears out what Mr. Brown says in regard to humidity. High humidity plays an important part in the drying of prunes. The humidity, unless controlled and increased, will naturally grow less as the moisture is taken out. That increases the heat and, of course, we get the sugar contents.

Mr. Paulus: Some people claim that, although you may have a temperature of 135 to 145 when you put in the prunes, a thermometer placed among your prunes will show considerably less than that. I want to agree with Mr. Brown about lye dipped prunes. The most beautiful prunes we ever put out were not lye dipped, and they were glossy. So many lye dipped prunes have their skins broken that we have kept those which were not lye dipped for facing, since the girls claim that they lose a great deal of time in trying to face with lye dipped prunes.

Mr. S. Jones: Do I understand Mr. Brown to say that the experiments showed that when the drying period was wet, 60 pounds of green prunes dried to about 17, and if the drying period was dry, to 19½ pounds. What had the seasons been prior to that?

Mr. Brown: There doesn't seem to be much relation between the early part of the season and the drying season in this particular.

Mr. S. Jones: It seemed to be due solely to the wet or dry period during drying?

Mr. Brown: Largely due to the air being heavy and the southwest winds which cut down circulation in the drier.

Mr. S. Jones: I had thought probably the prune had absorbed more water during the drying period.

Mr. Brown: No. The relation seemed to be entirely confined to actual weather conditions at the time of drying. I think it was entirely due to circulation of air. But I found in the analysis of prunes, there was little difference in the amount of moisture and the amount of sugar.

Mr. Taylor: Is it a fact that prunes raised on different soils can dry out one heavier than the other?

Mr. Brown: This is sometimes true. I observed some in Southern Oregon from high land and from low land, under exactly similar conditions, and the upland prunes dried heavier. I could not say that it is always true, however.

Mr. Taylor: We dry at the same drier from my orchard and my folk's orchard. This year, for instance, their fruit dried one pound heavier than mine, notwithstanding the fact that my Italian prunes tested larger, and the orchards are approximately the same altitude.

Mr. Brown: In that case, it is more than likely due to growing conditions.

DRAINING THE ORCHARD

By George H. Himes, Portland

Mr. President and Members of the Oregon State Horticultural Society: Several weeks ago your secretary asked me to prepare a paper for this meeting, and permitted me to select the topic, hence "Draining the Orchard" is my subject.

Not being a practical fruit grower it is probable that what I shall have to say will not . . be regarded as worth much to those engaged in the business; yet as my remarks are based on observation of the methods of a few fruit growers who have made a pronounced success in their line, I venture to proceed.

So far as can be recalled the first time that my attention was directed to the matter of draining the soil occurred in 1859 by reading in the New York Tribune a lengthy report in that paper of the proceedings of the Farmers Institute of that state in which the subject of "Drainage" was discussed at great length and a number of plans described whereby it could be put into operation, all of them very crude as compared with the methods of the present day. At that time I was engaged with my father in clearing land on our home place, a donation claim five miles east of Olympia, Washington Territory—although when we went there in October, 1853, that section of country was known as "Northern Oregon." A portion of the land cleared was a two-acre strip lying along side of a small stream. The soil was a light clay loam, with a good portion of vegetable mould quite evenly scattered through it. It had been planted and cultivated with a hoe quite thoroughly, but did not seem to respond as satisfactorily as my father thought it ought to in proportion to the labor expended upon it.

As a result of reading the discussion about "Drainage," above alluded to, we determined to try the effect upon that refractory two-acre tract. Then the question of ways and means had to be considered, as we had no lumber, and no money to buy any, and tiling such as is now being made did not exist anywhere in the region west of the Rocky mountains. One of my jobs on the farm had been to split rails, and I took a good deal of pride in making them as nearly uniform in size as I could without waste of time. Some times, however, when knotty timber was used a few rails from the topmost cuts in a tree would be 10 to 12 inches broad, and when the worm fence was laid up I usually threw those rails aside, saving them, however, for use in the case of some unforeseen emergency. That emergency, it seems, had now arrived, and a method of what was believed would produce the desired result was planned.

First—the preparation of the ground. That was plowed, first, to a depth of eight inches parallel to the creek; then harrowed at right angles with an ordinary V-shaped harrow, then in vogue; then in a week the ground was plowed at second time at right angles with the creek, and harrowed parallel with the creek. Then dead furrows were run at right angles with the creek about twenty feet apart, to the depth of 18 to 20 inches, care taken in all cases to secure a uniform grade as nearly as possible, with all loose earth carefully shoveled out.

Second—the preparation of the tiling. The broad rails alluded to were paired off in uniform sizes, and the thin edges trimmed with an axe so that they would lay quite close together. Then the rails were placed in the furrows like an inverted letter V, with a cobble stone of uniform size at each length of rail, and a stout peg a foot in length was driven down on the outside of the ends of each section in order to keep the rails in place. Then the rails were covered up carefully and the ground levelled. The grade on this tract was approximately four feet from east to west, but relatively level from north to south. This work was done in October, 1859. A stake was driven at each end of every furrow, in order to locate it if it became necessary for any reason. Without that there was no visible evidence of the location of the drainage furrows.

Third—this tract after being placed in the condition already described was thinly covered with a coating of barnyard manure and then harrowed and cross-harrowed once each way, and allowed to rest until March following. Then it was plowed shallow, say five inches deep, and harrowed once. Then Kittatiny and Lawton blackberries, raspberries, currants and strawberries were set out, and the yield of those small fruits from that tract averaged more than $600 per acre during the next ten years after the first year.

So far as I have ever been able to find out that was the first attempt at covered drainage in the Pacific Northwest.

The precise date when the first tiling as we now understand it was used in the Willamette Valley is unknown to me. The first that I know of was a five-acre tract upon the farm of the late Senator Nesmith at Rickreall, in Polk county, which was tiled about 1884 by one of his sons-in-law, Mr. William M. Molson, at a cost of $50 per acre. This tract was changed from a relatively worthless condition to producing within three years sufficient income to pay the cost of the tiling as well as the cost of producing the crops.

Numerous other examples might be given to illustrate the value of tiling in general, but time will not permit referene to them.

I will now relate an experience in orchard tiling, or, rather, the want of it, which came under my observation about thirty years ago.

Mr. A. W. Hidden, formerly of Vermont, then had a few acres in prunes a little ways north of Vancouver, Washington Territory, which were beginning to bear. His soil was a light sandy loam, and the growth of his trees and his care of them interested me greatly, for the reason that I had a firm belief in the proposition that prunes could be grown successfully in Oregon, at least in many parts of it, as in California a proposition that was stoutly denied by the people of that state as a rule. This conviction led me to visit Mr. Hidden often, and I watched his progress from year to year with unusual interest. In all the details of producing prunes, drying and marketing them he was successful to an extent beyond any other person that I then knew. He had enlarged his original orchard from three to sixteen acres, and had made a new dry house, containing numerous improvements, the direct outgrowth of his own personal experience.

From time to time as the years passed by I frequently walked through this orchard, row after row, and observed from year to year that here and there were trees that appeared somewhat stunted—trees that lacked the vigorous growth so apparent in most of them. I attributed that condition to a lack of under-drainage, and called Mr. Hidden's attention to it. He admitted that the trees lacked something, but confessed that he did not know what the trouble was unless it was a lack of nutriment. And accordingly that was supplied, but did not remove the difficulty. Then I said to him, "I believe I can tell you what ails your trees." "What is your opinion?" "I believe your orchard needs to be well tiled," I said, "at least a line of tiling between every third row." He laughed at the idea; it was absolutely absurd from his point of view. "Why," he said, "this whole orchard and much of the land adjacent is underlaid by a bed of river washed gravel and the water runs through this sandy loam like a sieve." About that time there came a summer shower—that was in the latter part of June—lasting about thirty minutes. After it had ceased he asked me to take a short walk and we passed by the corner of one of his buildings where there was a puddle about thirty feet across, caused by the shower, and handing me a yard measure, asked me to measure the depth of water at the end of a piece of a sill a foot square and fifteen feet long which lay in the puddle. I measured the water and found that it was nine and a half inches deep. Nothing was said about the reason he asked me to measure the water for more than two hours, and then we had occasion to pass the place where the puddle was, and behold all the water had disappeared. "There," said Mr. Hidden, with a triumphant expression in his voice and a look of satisfaction upon his face, "didn't I tell you this land hereabouts was like a sieve? Now you have the positive proof."

Then I admitted that he probably was right, and we never argued the question again, although I frequently visited his orchard for two or three years afterwards.

While I was convinced by this incident that my theory was wrong, yet I knew that something ailed a good many of the trees in this orchard; but the remedy for the trouble I did not find for more than twenty years.

A number of years before that Mr. Hidden had retired from business with a competence and sold his orchard. A few years ago Mr. Hidden and I met after a long separation, and naturally we renewed our acquaintance and began discussing some of the events and experiences of our earlier years. At length he referred to the discussion we had

had upon the subject of tiling orchards, and alluded to the incident of the water puddle as showing how he became the victor in our argument about the importance of tiling his orchard. Of course I remembered that occasion well, acknowledging that he had the best of it. Then I had one of the surprises of my life as he said, "I want to say now that you was right and I was wrong." "Is it possible?" said I; how did you find it out?" "In a very simple way," said he; "by personal investigation. Your remark about the necessity for under drainage for orchards regardless of whether they were located on level ground or not, or whether the soil was a sandy loam or otherwise, set me to thinking, and finally I began investigating my trees. The result of that investigation proved to me most conclusively that a uniformly successful orchard cannot be grown upon land that is not properly drained. I found that in every case where a tree was not doing its full duty was because its roots were more or less imbedded in clay, and that tiling was the remedy for that condition. In other words, trees, like human beings, do not properly thrive when suffering from cold feet."

In conclusion it should be borne in mind that frequently the remark is made that under draining does not produce the desired result. Wherever this is the case it may be depended upon that the tiling has not been properly installed. The initial step in the proper installation is that of carefully surveying the ground, which means the establishment of a grade and determining the location of every line of tiling, and making a plat thereof for reference so that it may be definitely known where every foot of tiling is located. And still another point that ought to be emphasized is the depth at which the tiling is laid. To the extent that I have any information upon that matter my judgment is that it ought to be placed between three and four feet deep.

Reference to one more point is timely here, and that is the value of under draining in the matter of saving time at a period in the course of the year's work when time saving is an urgent necessity. To illustrate: Ground that has been tiled can be plowed in the spring of the year within 36 hours after it has stopped raining without injury to the soil; whereas ground that has not been tiled cannot be cultivated under ten days to two weeks after the rain ceases without making the soil difficult to work. This was found to be the case as a result of experiments at the Oregon Agricultural College a good many years ago.

EVAPORATED FRUITS AND VEGETABLES OF THE FUTURE

By Frank J. Norton, Everfresh Food Company, Sutherlin, Oregon

What a wonderful chance for a dreamer; I used to be one but have been so rudely awakened by actual existing conditions that we can only hope that some day our dreams will come true. This can only happen when we strive to obtain results that are ahead of us today.

In Oregon our drying will always be mechanical and I believe that California will be lead to adopt this more and more as every little while an off season causes losses which would carry an investment of dryers for a considerable period. For instance in drying prunes California has a cost of about $7.50 per ton for sun drying while our costs will run about $20 per ton this is considerable of a handicap but in event of bad weather in California this is largely made up by the losses sustained.

In the large dryers of the state the heat, circulation, and humidity is largely under control while with most of the small dryers the operator often obtains results that are discouraging because he cannot control these features; it would seem that there is a vast opening for experimentation along these lines as any improvement which will make for better product is worth while.

The future growing of crops for evaporators will be largely governed by our results of today; in this we are handicapped by the fact that we must use varieties that have been planted for the green fruit trade largely and not for evaporation this condition as it regards fruit cannot be changed overnight but future plantings should be governed with this fact in view. In the vegetable line we are more fortunate as we can change from one variety to another in a season.

Many growers are prone to think that evaporators are maintained principally as a dumping place for stock that is not fit for other purposes; this is far from the facts and with the exception of the apple only those fruits and vegetables of the best quality should be used; this is absolutely necessary if we are to further our business and extend our future markets.

Where are our markets? Among the farmers of the Middle West, laborers or the city dweller; statistics show that Los Angeles uses more dried vegetables and fruits per capita than any other city in the United States. This is contrary to expectations as this city is supplied with fresh fruits and vegetables the year around the answer then is that people of this city live in small quarters and are composed of small families and it is cheaper to use dried products than the fresh; thus it would seem that our future market lies principally within the large congested districts; before we can extend our markets the future work is to overcome the prejudices that have existed regarding the use of dried fruits and vegetables especially. This has been overcome to some extent by the campaign of the government in the use of the home dryer thus a large portion of the people are becoming acquainted with the good qualities of the dried foods.

One of the most serious handicaps to extending future markets lies in the fact that all dried products are liable to infection with weavils and packing must be done in such a way as to exclude any chance of infection; for bulk goods cold storage seems to be the solution.

Will the government come into the future market and be a factor in the use of dried vegetables. This we do not know, but to date the government has not purchased one pound of dried vegetables for army use. In fact they are prejudiced. To be sure some branches have used these products to some extent like the Geodectic Survey and the Alaska R. R. Commission.

Will the type of dryers be changed in the future? This will depend a good deal on the use to which it will be put. The present tunnel dryer is the most used at the present time and with some improvements will answer the purpose for some time on account of the cheapness of construction. Re-circulating dryers will not be practical for the farmer on account of the cost of the intial investment. This type will be used for the large central plants.

In a short time you will see all patents, processes and trade secrets open to all and only then will you see the industry thrive.

The farmer may think he is doing a good bit of business when he sends some prunes to some grocer friends back East but he is more likely digging his own grave, for the reason that the grocer often allows the prunes to become infected and they will get wormy. We sterilize our fruit ourselves, then wrap them in a wax-tight paper, sealing up the sterilization, and thus keep out infection. All fruits and vegetables are susceptible to the infection. Here are two styles of packages - this one with the wax-tight and outside wrapper and one with the wax-tight inside. Both packages would be absolutely worthless unless sterilization has taken place. I have purchased tin cans which were utterly worthless, since the contents had not been sterilized. The eggs hatched out and the larvae could not escape and hence consumed the contents. Those are things which hold back the founding of future markets. The housewife gets one case of infected goods and she never tries another. In Utah, I found a case of Oregon prunes which had been infected. The worms were between the box and lining and infection was probably in the box and not in the fruit. Cold storage is practically the only solution of taking care of bulk fruits and most all of the jobbers are recognizing that and putting in cold storage plants. Great care must be taken in packing, whether the man who operates the drier is a small one or a large one. He does harm in getting out produce where infection has taken place, for these are the worst stumbling blocks that we have to contend with.

WHAT OF THE FUTURE OF THE FRUIT INDUSTRY?

By A. H. Harris, Industrial Writer on the Evening Telegram

Trend of the Times Which Affect Fruit Producers.

The world is becoming smaller. Portland and Paris are neighbors today.

The business of human slaughter is forcing the early end of the liquor industry. Men can only fight one enemy, successfully, at a time.

American enterprise has made farm power machinery possible, following the perfecting of the gasoline engine.

World war has made it necessary for American women to go upon the land and produce food. Entirely new agricultural and industrial problems are in sight.

The makeshift schemes of distribution have broken down under pressure. Distribution of crops must come on a scientific basis. War will force reform.

The demand for food, which must be met, will go far toward bringing about the enrichment of country life, so much desired and so long postponed through faulty marketing schemes and brutal speculation in land values.

Control and construction of transportation systems must come, in fact are pretty well recognized as already at hand. A thousand dinky railroads, each struggling under a tremendous burden of overhead expense, are to be articulated into systems intended to give service to the people.

In Oregon, shipbuilding is to become a permanent industry of large proportions. Forests will be removed. The Columbia river will become the lumbering center of the United States. Local markets will be developed. Idle land must be utilized.

Evaporating facilities will grow until the fruit and vegetable crops will be utilized, with profit to the producer. The cannery will give markets for certain varieties of fruits and vegetables at increasing prices.

Wildcat speculation in land must be made impossible, or at least classed with disloyal acts of other enemies of the nation.

Every fruit grower in the Northwestern states is vitally interested in and must of necessity be a student of two or three important trends in the life of the nation and its people at this time. The great world war has suddenly forced upon us conditions which a few years ago were not dreamed of, and at the conclusion of the great slaughter other conditions will come which must nearly revolutionize the agricultural and industrial life of the American people. It is not with the wisdom of a prophet that I would consider some of these problems, briefly.

Three great trends in the activities of the American people are even now well defined. They are the development of gasoline power for use on the farms of the country, the spread and apparent popularity of prohibition, and the necessity created by the war for women to enter the ordinary vocations formerly held by men. Particularly do I want to consider the relation of agriculture and horticulture to the drift of women toward the land and the shop. Each of these three affects directly and materially the business and chances for success of every man and woman now engaged in the production of fruits and berries.

I will not attempt to consider the questions suggested in the order of their importance, for that would be a matter of judgment, only. I will consider them, however, as I see their relation to the production and marketing of fruit in Oregon.

Nation-wide Temperance Movement Aid to Industry.

The wave of prohibition had swept well across the country before the United States entered the great war, but the conclusion of the war, in my opinion, will see nation-wide temperance by custom if not nation-wide prohibition by law. The saloon has gone, at least in this country, and its going has left to the fruit and berry growers of the nation an open field for the development of the fruit-juice industry. The source of supply of raw materials must be the orchard and berry patch and vineyard instead of the hop yard, the corn field and the barley field. In other words, in my opinion, one of the most encouraging signs of the times, from the angle of the orchardist, is the apparent well-defined purpose of the masses to destroy the malt and spirituous liquor business of the country.

Gasoline Engine Coming Farm Power.

The development of power farm machinery is going further, it would seem, to overcome the shortage of labor and improve conditions of living in the country, than did the invention of labor-saving machinery during the nineteenth century. It is likely that hundreds of thousands of American young men—not to say millions—will be destroyed in the war in Europe, and there will be no men in this country to take their places. The supply of farm labor has been short for a number of years. Every year the cities have beckoned to the country lad and he entered industry and grinding competition, leaving the soil to lie idle or be cultivated as best the work might be done without him. The tractor, in one form or another, promises to take the place of millions of men and horses and to largely simplify farm labor. If the tractor does nothing more than make farm work more agreeable and life on the soil more to be desired, it will have served a great purpose. If it can take the place of men destroyed in the war and make cultivation of the soil cheaper and more stable, it will go a long way toward revolutionizing practice in agriculture and horticulture.

Better Marketing Methods Being Developed.

Two or three important factors are soon to enter into the fruit business of this state. Methods of evaporation have been so improved that there will be no good reason for selling all of the fruit crop in fresh condition. With modern methods of preservation the marketing period can be made to extend over the whole year, and entirely new market fields can be profitably opened in Australia, China, Japan and other far eastern countries. South America soon must become a heavy buyer of Oregon fruits and berries. Crude methods of distribution, alone have prevented the opening of that field, already. The reorganization of world shipping which must follow the close of the war will certainly give the Pacific coast ample facilities for the handling of the annual fruit crop. At any rate the fruit growers of the Northwest should see to it that their interests be not overlooked nor discriminated against.

The problems of marketing must be met by the introduction of new methods of distribution. The machinery employed by fruit growers to maket their product is altogether too cumbersome and expensive. With the movement, nation-wide as it is, to stop waste, an army of middlemen are to be eliminated before the war gets fully started among the American people, and when the war ends the country will be ready for efficient methods of distribution and fair marketing conditions. Nobody will want to return to the present idiotic methods after the government has shown clearly what can be done when it is necessary for every man to either farm or fight.

Women to Become Tillers of the Soil.

When the day comes that every American man must farm or fight—and it seems to be coming rapidly—the labor problems will be solved by the women of the country who will leave the kitchen for the grain field, and the orchard. This entry of women into direct competition with farm workers will be more vital in the industrial life of the country than was the entry of women into factory life during the last century. The new conditions will likely be maintained, at least for a long period following the war. It is difficult at this time to even conjecture the radical changes which must come on the Pacific Coast.

Another factor must not be overlooked. With the destruction of European countries which is now going on, will come the demand for reconstruction, and thousands of the keenest men in this country are certain to cross the seas in an effort to build fortunes quickly, leaving their own country to work out its problems as best it may.

Reforms in Eating are of Importance.

With war conditions in this country has come a reform in eating which ultimately will mean much to the grower of fruit. It is being shown, and clearly, too, that a lighter diet than has been the rule in the past, will give health and strength to the multitude. With this lighter diet fruit and vegetables must become more important factors in the feeding of the people, and the increased consumption of fruit must mean wider markets and better prices, in comparison with the cost of production. Americans have become a meat-eating nation, and if the war shows the fallacy of excessive consumption of beef and pork, and the wisdom of increasing the use of fruits, it will have served well the fruit growers of Oregon.

Utilization of Forests Back of State Industries.

During the coming half century Oregon must become the center of the lumbering industry of the United States. There can be no question about this industrial development, for two reasons. The first is that the last great American forests are situated in this state, and the second is the state of Washington is cutting her forests much faster than Oregon is. While Washington is now nearly the center of the lumbering industry, the Southern states are well cut out, and by the time the forests to the north of us are removed, the state of Oregon will be coming into the period of greatest production, at least in dollars and cents.

In other words, lumbering and shipbuilding are promising industries at the outset of the war period. As it now appears, lumbering is to be